

REPORT ON LEPROSY

AND THE

TRINIDAD LEPER ASYLUM

FOR THE YEAR

1889.

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MARAVAL,
February 4, 1890.

Sir,
I have the honour to forward for the information of His Excellency the Governor a Report on Leprosy and the Trinidad Leper Asylum for the year 1889.

I propose to discuss the different subjects which call for notice, in the order in which they are given in the table of contents.

1. ADMINISTRATION.

During the year the following alterations, additions and repairs have been made in the Asylum buildings:—

1. A new ward containing thirty beds.
2. A new block on the female side containing wash house, linen room, bath room, and latrines.
3. A porter's lodge at the entrance from the main western road to the Asylum grounds.
4. New latrines on the male side.
5. Various minor repairs.

The new ward was handed over by the Public Works Department on December 24, and a few days after the patients were transferred to it from the former infirmary. This building was then occupied by the boys from ward 3, which ward was at once filled with patients transferred from the Colonial Hospitals at Port-of-Spain and San Fernando. Thus at the present time the Asylum contains 210 inmates, every bed being occupied. To make way for the new ward the old wash house and latrines had to be demolished. This was an advantage, as the buildings were old, and unsuited for the present requirements of the Asylum. A new block containing wash house and other offices was erected close to the women's ward, the old building which served as bath room, &c., and which was very rotten, having been removed.

The transfer of the wash house and linen room to the female side is found to be advantageous, as it removes any necessity for the women to go over to the male side to fetch clothing, and being close to the new building they are able to assist in mending and ironing.

In place of the latrines destroyed on the male side, a new block was built against the eastern wall of the central court.

The front savana being enclosed and a porter's lodge erected by the lower gate, all this ground is now available for the patients. This extra space was badly wanted, the central court being far too small for 166 men and boys.

Numerous repairs have been effected in the old male wards and administration block.

A school for boys has recently been started. O'Brady, one of the inmates, has undertaken to teach them, and at present there is great energy on the part of master and pupils.

A book case and a number of books have been given by the Government during the year, so that there is now a very fair nucleus of a library. The book case is placed in the old porter's lodge and is much resorted to by the more intelligent patients. Many friends in Port-of-Spain have been kind enough to send illustrated and other papers during the year. These are always appreciated by the inmates: even those who cannot read look at the pictures. The Coolies are very interested in pictures of scenes in their own country.

His Excellency the Governor has kindly sent tennis rackets and balls twice during the year, and these and other games have given amusement and recreation to the boys and women.

The chief additions and alterations now wanted are as follows:—

1. Complete enclosure of the Asylum grounds.
2. A gallery on the north of the women's ward.
3. More accommodation for the nursing staff and more chapel room.
4. Painting and whitewashing throughout the Asylum.
5. Some minor repairs.

These items are I believe under consideration for the present year.

The complete enclosure of the Asylum grounds is part of a much larger question which is being warmly discussed all the world over—the segregation of lepers. I shall have more to say on this subject under the head of contagion.

Meanwhile it is urgently needed for the control of criminal and disorderly patients. Of these there are some in the Asylum as elsewhere.

On referring to the table of discharges it will be seen that two women were transferred to the Colonial Hospital because they were found to be pregnant, and that one man was arrested by the Police for wounding another patient with a razor. Another woman was discharged for threatening another with a knife or razor, and one more for throwing an iron bar at one of her fellow patients.

With reference to these two classes of offences it must be pointed out :—

1. That immorality in male and female lepers will not be prevented until some further steps are taken.
2. That criminal lepers who threaten and wound others cannot be dealt with under the present regulations and staff at the Asylum.

For the control of immoral lepers there are three alternatives :—

1. The building of a high wall all round the Asylum, in fact making it into a Gaol. This would be very costly, but if compulsory segregation is established it will be necessary.
2. The erection of leper quarters in the new reformatories. The Dominican sisters have no influence over the more hardened of the women, and nothing short of the discipline of a reformatory is likely to avail.
3. The removal of some of the most troublesome patients to an island, as was done at Molokai. Leper huts could be built and certain of the patients could be married by a priest. This Father Damien found to answer in his leper colony. There need not be much fear of a large increase of population. From 1866 to 1854, 2,864 persons were consigned to the leper settlement at Kalawao, and in 1884 there were twenty-six children alive who were born at the settlement, and one or both of whose parents were lepers before each birth. Only two of these had developed leprosy up to date, though, in addition to being born of leper parents, they had lived in the houses of lepers all their lives.—(Dr. Fitch. Appendix to Report on Leprosy in Hawaii, 1886, p. xxxi).

Such an island would of course have to be under Police supervision, and could be visited by a doctor in a steam launch once or twice a week. The quieter and more infirm patients could be retained at Cocorite, and banishment to this island could be made a punishment for bad behaviour.

Of the second and equally troublesome class—the criminal lepers—we have had a notable instance during the year. A male inmate had a quarrel with another patient and inflicted with a razor a most serious wound over the left lower ribs six inches long. Had this wound been two or three inches lower, the victim would probably have been disembowelled. The assailant was tried before the Stipendiary Magistrate of Port-of-Spain, and was sent on to the Supreme Court, where he was acquitted. From mistaken motives of charity I re-admitted him to the Asylum in a moment of weakness. In two months more it was found necessary to discharge him again for using language to the Dominican Sisters too filthy to repeat.

It will be impossible to treat this man again in the Leper Asylum. He has already had five years in Gaol for some criminal offence; he is utterly reckless, and would be as likely as not, at any moment, to kill another patient should he be provoked in any way. No one can expect the Sisters to submit to such language as he is frequently guilty of. In such a man nothing but Prison discipline in the Royal Gaol or a Reformatory, or Police supervision on such an island as that mentioned will be of any avail.

Of course if a law for the compulsory isolation of lepers is passed, the Asylum or any island where lepers are segregated will become a Prison, and new legislation with a sufficient staff of Warders will give the Superintendent of such institutions power to deal with criminals and disorderly patients on the spot.

During the year the baker was superannuated on account of failing health, and his successor was discharged for suspected complicity in stealing bread. The cook also was discharged for negligence and unsatisfactory explanation as to food which was passed over the kitchen wall to persons waiting outside.

This abstraction of food from the Asylum is another very serious matter which will only be righted by further enclosure and isolation. I have employed detectives to endeavour to catch the offenders, but without success. Food has been passed over the kitchen wall, and has been lowered from the gallery of No. 4 ward. There is little doubt that many people and pigs in Cocorite Village are kept in this way at the expense of the Government. When patients are discharged from the Asylum, they very often remain in some shanty close by, corrupting the inmates and receiving food as above pointed out.

Legislation to prevent the harbouring of lepers is badly wanted, though of course this could hardly come about, but as part of a scheme for compulsory segregation.

Some patients while in the Asylum have families and animals in the Village, for whose support there is no doubt they often carry or send out food. I have attempted to obviate this as far as possible by forbidding any one to bring in or carry out parcels or receptacles unless they consent to their being searched at the gate; but there is no doubt they often get such food over the wall or fence without being detected.

2. STATISTICS.

The general statistics for the year show little variation from those for 1888. The admissions and deaths are the same, while the discharges are increased by 2. The number of inmates on December 31, 1889, was 179.

The percentage of deaths for the year was 7.40, being .07 less than the year before. This is the lowest percentage ever recorded at the Trinidad Asylum. As I have before remarked, I cannot help thinking that the immediate and deep incision of sinuses and ulcers has much to do with the prevention of gangrene and consequent lowering of mortality. This will be again referred to under the head of perforating ulcer.

Of the 38 admitted during the year, 23 were natives of Trinidad, a slightly higher proportion than usual. There were 12 re-admissions.

Seven of the 21 discharges were for breach of rules, 2 Coolies left for India in the return ship, and one patient was discharged because she was found not to have leprosy.

Of the 20 lepers discharged there are only 6 now at large in the Colony.

Of the 16 deaths, some form of kidney disease was found in 7 after death. In 2 of these 7 there was also tuberculosis of viscera. Two patients died from diseases which are rare in Trinidad, sunstroke and morbus Addisonii. Two died from cerebral causes; one from phthisis and tuberculosis; two from exhaustion and ulceration; one from heart disease, and one from asphyxia due to leprosy deposit in the larynx. In three patients the ankylostoma duodenale was found post mortem. Full particulars of the autopsies are given in Table VII. Leloir (*Traité theorique et pratique de la lèpre*, p. 179) says that anæsthetic lepers hardly ever die of phthisis. This is certainly not the case in the Trinidad Asylum, where death from phthisis is very common in the anæsthetic as well as in the other two forms of leprosy. It will be seen from Table IX. that most of the deaths occurred at the beginning and end of the year.

Of the 261 intercurrent diseases, 130 or just half were cases of malarial fever. There were 26 cases of diarrhoea and 14 of dysentery. Only 11 cases of leprotic fever were noted during the year.

The operations were trifling, 192 of the 401 being incisions of various kinds, and 168 removals of necrosed bone or cartilage. One amputation through the leg was performed for gangrene, but failed to save life. There were 25 amputations of fingers and toes.

In one case I ligatured in each eye the vessels supplying a tubercle of the conjunctiva. The operation gave some temporary relief by reducing the size of the tubercles and improving sight, so much so that the patient asked that the operation might be repeated. For some years past I have done this operation with a certain amount of temporary success, but the effect can only be palliative. I see in Leloir (*op. cit.*, p. 316) that for tubercle of the cornea Kaurin performs Keratotomy and Danielssen and Hansen canterize the cornea or conjunctiva around the tubercle.

The remaining statistics will be dealt with under separate heads.

3. THE QUESTION OF CONTAGION.

This is the burning question of the day, and has been warmly discussed throughout the year in almost every paper and review, lay and medical.

An impetus was given to the question by the death early in the year of the heromartyr Father Damien, by the discovery of a leper selling meat in Whitechapel, by the reading of a paper on Leprosy by Dr. Abraham before the Epidemiological Society, and by the formation of a Leprosy Committee and National Leprosy Fund in London under the presidency of H.R.H. the Prince of Wales.

With regard to the value of Father Damien's case and that of the inoculated convict Keanu for absolutely proving contagion, one cannot logically accept them as final, for they both occurred in a country infested with leprosy.

In my Report last year I dwelt at some length on Keanu's case, and the same remarks apply to Father Damien. Living in a colony of lepers as he was we cannot be sure whether he became infected from actual contact with them, or from food, water, or some intermediary host. Most people now-a-days believe in the leprosy bacillus, and the question is narrowed down to this: Can a healthy person more readily derive the bacillus from an infected human being, or from food, air, water or some host which contains the bacillus or its spores? In any case, whether or not we accept Father Damien's case as proving contagion, it becomes I think an argument for segregation, for every leper may very possibly become a centre for the dissemination of bacilli or spores in his immediate surroundings, and by reducing these centres the spread of the disease may possibly be checked. We do not yet know what is the life history of the bacillus outside the body, but it is quite

possible that there is an intermediate spore stage which has not yet been recognized. This theory of an intermediate stage or host might explain the difficulty or impossibility of direct communication of the disease from one subject to another, as in the analogous case of tape worms and other cestoda, or again in the case of the filaria sanguinis hominis, where the mosquito is the intermediary host.

Against this suggestion it will of course be argued that cestoda and nematoda are animals, whereas bacilli are plants. This, however, will not upset the possibility of a spore-stage, and what nidus the spores may find outside the body is only of secondary importance.

With reference to direct inoculation Mr. Hutchinson speaks very clearly (*British Medical Journal*, June 29, 1889, p. 1449): "With due care in the transplantation of a bit of living tissue, no doubt lupus might be transferred from one person to another, and so also cancer, but neither of these diseases is contagious in a practical sense." In the *Lancet* for December 28, 1889, p. 1339, I see it stated that Hanau has recorded the successful implantation of cancerous growths by grafting on the rat; if this is true, Hutchinson's prophecy is fulfilled.

Dr. Arning has lately sent me a brochure entitled "Eine Lepra-Impfung beim Menschen," in which he describes at length his inoculation of Keanu. Before entering on his case he mentions two instances of experimental inoculation of healthy individuals which were first quoted by Leloir. In the first instance a Norwegian physician inoculated himself and twenty healthy individuals with leprous material without result, and in the second instance Profeta in Italy inoculated between the years 1868 and 1884 two women and eight men also without success. Of course one positive case is worth any number of negative ones, but the latter ought certainly to be quoted side by side with the former.

Archdeacon Wright has published another work on the subject of contagion entitled "Leprosy an Imperial Danger." This has naturally attracted much attention amongst the laity, and from a literary point of view is well written and attractive. From a medical standpoint however it is full of inaccuracies. I will only point out a few in passing.

1. He states that tuberculated leprosy is the most prevalent form in Trinidad.

The percentage of the three forms existing here, calculated on the Asylum records for eighteen years, was published in the Asylum Report for 1885 as follows:—

Tuberculated	...	...	...	36
Anæsthetic	...	...	...	44
Mixed	...	...	...	20

2. From another passage (apparently derived from Leloir) he leaves it to be inferred that red men, i.e., Indians, are readily affected here.

Dr. de Verteuil, writing in 1856 (*Trinidad*, p. 154) says: "At present there cannot be above fifty to one hundred Indians in the Colony," and at the present time—34 years later—it is I believe generally admitted that there are no pure-blooded Indians left, though there are occasional visitors from Venezuela. It is true there are a good many half breeds of whom one or two have been in the Leper Asylum, but one cannot say that Indians in Trinidad are readily attacked by leprosy.

3. The statement is made that a large proportion of foreigners at Molokai become leprous.

To prove this the total number of foreigners resident there ought to be given, but this is omitted. Dr. Mouritz in his Report, dated March 31, 1886, (Appendix to Report on Leprosy in Hawaii, p. cv.) gives a census of lepers at Molokai, from which it appears that only 27 out of 652 are foreigners, viz.: Chinese 19, German 4, British 2, Pole 1, Belgian 1.

4. With reference to the question of communicability of leprosy by vaccination, Archdeacon Wright quotes one affirmative reply written by a Trinidad doctor in answer to a confidential circular. It should be pointed out in fairness that some thirty or more other Trinidad doctors to whom the same circular was addressed returned negative replies.

I might multiply examples, but I think the above are sufficient to show that the statements in the book must be taken with reserve. It seems to me that in the writer's anxiety to strengthen his arguments in favour of contagion, too much reliance has been placed on stories told by traders, negro nurses and others who are scarcely in a position to give scientific evidence.

The statements of Drs. Magalhães and Mayrink (quoted by Leloir, p. 300) that before the discovery of Brazil there was no leprosy amongst the Indians, nor subsequently in those who did not mix with the foreigners is, I admit, an important one, though whether the disease was derived directly from the foreigners or from centres of infection which they set up is of course a question.

To recapitulate, I am not prepared to admit, as far as I have studied the subject, that leprosy is contagious in the ordinary sense of the word; but I think that segregation might do good in Trinidad as it has done in Norway by lessening the number of infected foci. At the same time if the patients were under Prison laws and discipline, the administrative difficulties complained of above would be solved. At any rate the experiment would be worth trying.

4. LEPROSY IN TRINIDAD.

In Père Etienne's book, "La Lèpre est Contagieuse," the number of lepers in Trinidad is given as follows :—

1805	...	...	...	...	3
1813	...	...	...	...	73
1817	...	...	...	...	77
1878	...	...	...	...	860

In Archdeacon Wright's work already cited, the number is given as 480.

Both these last numbers have been extensively copied by lay and medical writers, but I can find no authority for either of them, nor can I ascertain that any regular statistics had ever been taken of the lepers in Trinidad before 1889. A circular was then sent round from the Surgeon-General's Office, the replies to which have so far revealed only 348 lepers in the island, 210 of whom are in the Asylum (*vide* Table xvii). Of course one cannot rely absolutely on these figures for there are doubtless many unreported cases, but one would have to allow a considerable margin to arrive at 480, and a very wide one to get 860, the number recorded for 1878. Either then the number of lepers has rapidly decreased or one or other set of figures is very far wrong. It would be an excellent thing if a leper census could be taken next year when the general census is taken in Trinidad.

Of the total number of 216 lepers treated in the Asylum last year, 74 or rather more than one-third were Coolies. Of the 138 reported from outside only 29 were Hindus. No doubt there are more, for Coolies when free do not seek medical advice so readily as other patients, unless they are paupers and wish to be maintained in the Colonial Hospital or Leper Asylum.

On the whole then the proportion of Coolie lepers may be fairly taken as one-third. The question is : Where do they get the disease ? We are told that there are some 250,000 lepers in India, and it is therefore hardly fair to suppose that all the Hindus who develop leprosy in Trinidad become infected here. It is far more likely that in some or many of them, the disease is already incubating when they land here, though it may not be evident enough to ensure rejection after medical examination.

Dhoney, a Coolie suffering from anæsthetic leprosy who was sent back to India in the "*Mairi Bhan*" in 1885, told me that the first spots began in the bend of his right elbow in Calcutta 25 years ago, in fact long before he left India.

During the six years in which I have been in charge of the Asylum six patients have been allowed to return to India. One year more than twenty applied and three were selected. It would seem fair that a larger proportion should be allowed to return, and also that the greatest care should be taken in India in selecting emigrants.

5. EARTH AND FOOD.

Following on what has been said as to the possibility of an intermediate spore-stage of the leprosy bacillus existing outside the body, the examination of earth and food becomes important.

To test the first point, the possibility of leprosy spores or bacilli existing in ordinary soil I examined earth from the surfaces of eight graves in the Cemetery at the Leper Asylum. I thought it possible that bacilli might have been brought to the surface by earth worms as was shown to be the case by Pasteur in anthrax. It also seemed possible that the section of the bodies after death which is regularly practised at the Asylum might hasten decomposition and so favour the rapid dissemination of bacilli or spores. A few cubic inches of surface earth were therefore taken from each grave and examined microscopically. The results are given in Table xv. It will be noticed that many bacilli were found, and that the earth stained deeply. It is noteworthy that the only case in which bacilli were not found was one in which no necropsy had been performed, in consequence of my absence at the time of the death. In this case however the interment had taken place only about seven weeks before the examination, so that there could scarcely have been time for bacilli to reach the surface.

It must be noted as against the value of these results that similar rods and staining of the earth were found on the surface of the grave of No. 13, who died of phthisis and had no leprosy, having been admitted to the Asylum by mistake during my absence. It may be argued that in his case the rods were tubercle bacilli ; but as a control experiment I examined earth from my garden at Maraval, a mile away from the Asylum, and found similar rods and staining there. On the whole then we must conclude that these appearances had no connection with leprosy. The rods were certainly far too large for leprosy bacilli, and were probably ordinary putrefactive bacteria. The staining of the earth was most likely a mere accident due to chemical change, or to some mechanical impediment which the magenta-stained particles of earth offered to the free action of nitric acid. We might also argue that the earth in the Leper Asylum Cemetery had become so soaked with leprosy products that it retained the characteristic stain, but the result of the control experiment would upset this theory.

If it were once shown that leprosy bacilli reached the surface after interment, cremation would of course be the only logical course to adopt, to check such a possible means of dissemination.

With regard to food I have examined microscopically salt pork, salt fish and pigeon-peas, three of the favourite foods of negroes and Coolies in Trinidad. I have found various rods and spores, but no evidence of leprosy bacilli. Many writers hold the opinion that leprosy may depend on infection through decaying food, notably bad fish. I however found no difference, as regards bacilli, in the food I examined, whether it was decaying or not.

The examination of pigeon-peas was suggested by the late lamented Professor Boyes Smith of Netley. In a letter to me, dated December 26, 1888, he says: "Has your attention ever been directed to its possible connection with blighted grain? Dr. Kirk, the author of the Medical Topography of Upper Sind, believed that the consumption of damaged *Urhur Ddl* (*Cytisus Cajan*) was one of the causes of leprosy. You will find a very interesting letter on this subject in Dr. Norman Chever's Medical Jurisprudence in India, 3rd ed., p. 306, and information regarding the pea (the pigeon-pea) in Church's Food Grains of India, 1886, (one of the South Kensington Museum Science Handbooks). Do the Indian Coolies ever take this variety of vetch with them to Trinidad?"

Cultivation experiments made with portions of the different earths and foods also failed to show any leprosy bacilli.

So far then I must regard the results obtained from food and earth as negative, but there is an immense field for investigation in this direction.

6. FURTHER CULTIVATION EXPERIMENTS.

Various culture experiments have been continued during the year, and an account of the results is given in Table XII. For the most part cultures from viscera were attempted, and were continued to the second and third generations. The same white or yellow oily growth described in last year's Report was most frequently observed. Many of the tubes were left undisturbed for five months before being examined, but on being opened they showed no contamination except sometimes a little ordinary mould. In no case did the microscope show any rods which retained magenta after the action of nitric acid, but micrococci were abundantly found.

It is of course a question whether the spores of the bacillus lepræ answer to the same tests as the bacillus itself: if they do not, they may readily escape recognition. It is worthy of note that pieces of the cerebral hemispheres when planted in a nutrient medium did not give a growth apparent to the naked eye, though the microscope revealed a few micrococci. This may be only accidental, but on the other hand it is consistent with the absence of bacilli in the brain, which has always been noted by other observers and myself. The value of the micrococci is however greatly lessened by their presence in a control tube which was left without being inoculated.

Cultures were also tried from portions of earth from the graves already mentioned, and from food. Rods of various lengths and micrococci were observed, but no leprosy bacilli.

7. INOCULATIONS OF ANIMALS.

A cat which was inoculated four and a half years ago was dissected, but no bacilli were found in the viscera or at the site of inoculation.

Another cat which was inoculated five and a half years ago is still living. When examined last September it showed no evidence of leprosy.

Two rabbits and two pigs have been inoculated. One rabbit died fourteen days after inoculation and the fragment of tubercle was found unchanged beneath the skin, enclosed in a false membrane of lymph. No bacilli were found in the skin or viscera. This resembles the results obtained in fowls. (*British Medical Journal*, Feb. 5, 1887, p. 275.)

The pigs and other rabbits are still living and have shown no signs of infection as yet.

Several guinea pigs were inoculated with cultures from tubercle and femoral gland with negative results.

If the Home Government could see its way to sanction the inoculation with leprosy of two or three condemned criminals in Trinidad, and the commutation of their capital sentences to imprisonment for life, important additions could be made to our present knowledge of the pathology and proper treatment (by segregation or otherwise) of the disease. I can safely predict that many criminals would gladly accede to such an alternative, on having the case clearly stated to them.

8. PROTECTIVE AND ANTAGONISTIC INOCULATION.

Many diseases have been described as retarding the progress of leprosy. Thus Danielsen and Boeck (*Traité de la Spédalsked*, p. 324) speaking of the effects of an outbreak of variola in the St. George Leper Asylum in Bergen say: "Après la guérison de ces ulcères et l'entière destruction de ces tubercules, et à l'exception de cicatrices, tantôt petites, tantôt grandes, mais enfoncées, la peau ne laissait douter aucune trace de tubercules aux endroits qui s'en trouvait affranchis." I have noticed similar swelling of the skin and subsequent

disappearance of tubercles at the Trinidad Asylum in patients whom I have vaccinated. The following is a typical case :—

Ellen A., Negress, aged 17, suffering from mixed leprosy, admitted February 12, 1889.

February 15.—Vaccinated in left arm.

February 19.—Face swollen. Arm beginning to rise, but no inflammation at the site of vaccination.

February 21.—Four successful insertions.

March 1.—Swelling has gone down.

March 11.—Tubercles almost gone from face. Skin dry and wrinkled. Fever gone.

March 15.—Face and extremities desquamating. Hardly any tuberculation to be seen.

March 18.—No tuberculation. Some swelling of fingers and toes.

Hardy mentions pleurisy, pneumonia and variola as acting similarly. Leloir (op. cit., p. 224) also describes erysipelas as retarding leprosy. This I have noticed in the Asylum here. He also mentions a disappearance of cutaneous tubercles when the patient is attacked with phthisis. This is very marked towards the end of old tuberculated cases in Trinidad, and post mortem I have found tubercles not only in the lungs, but often also in the viscera. The connection between leprosy and tuberculosis I hope to discuss in a future Report.

All these instances of the retarding effect of other diseases on leprosy seem to point to the possibility of antagonistic inoculation; for variola, pneumonia, erysipelas and phthisis are each associated with a distinct micro-organism.

It was not long therefore before such inoculations were attempted. Cornil injected jequirity into leprous patches without effect. Campana inoculated lepers with erysipelas with the result that nearly all the patients in the ward got erysipelas and the ward had to be closed. No effect was produced on the progress of the leprosy. (Leloir op. cit., p. 316.)

In view of this apparent antagonism I have been making during the year some experiments on the treatment of leprosy by inoculation of cultures. As we are not yet certain that the bacillus lepræ can be grown on the ordinary media, protective or antagonistic inoculation may appear somewhat premature. Still I thought it worth while to take a working hypothesis and go a little ahead of our actual knowledge, for the cultures from fragments of tubercles or viscera might contain either spores or some secretion of the bacillus, and so set up some recognizable changes when injected beneath the skin.

Even if the growths are not leprous they may be of value in destroying leprosy bacilli, for Campana has described relief in phthisis from the inoculation of bacterium termo.

There are three conditions in which such inoculations might be of use :—

1. In anæsthetic leprosy to arrest further growth in the nerves.
2. In tuberculated leprosy to cause local destruction of tubercles, or to protect against further growth.
3. In leprotic fever, to arrest the outbreak of tubercles.

In the first series of cases I have found temporary swelling, redness, and sometimes suppuration, but no permanent effect. I may mention here that I have never known an anæsthetic leper develop tubercles. Leloir, (op. cit., p. 209) however, mentions three cases in which pure anæsthetic leprosy afterwards became mixed from the development of tubercles. In one of these cases the tubercles disappeared by suppuration, and the case became anæsthetic again. One or two old anæsthetic patients at Cocorite have told me that they were formerly tuberculated. The alleged disappearance of tubercles was, however, before my time, so that I cannot vouch for its truth, nor can I be sure whether they were anæsthetic before they became tuberculated.

In the second series I have noticed in some cases a certain amount of local ulceration and destruction of tubercles, but not to any marked extent. The ulcers soon healed, leaving the tubercles nearly as large as before.

In the third series I thought that the receptivity of the patient might be increased by the leprotic fever, and that possibly the leprosy bacilli being more active at that time might be more amenable to the influence of antagonistic cultures. The same local effects were, however, observed in these cases also.

A detailed account of the various inoculations is given in Table XIV.

9. RESULTS OF CHAULMOOGRA TREATMENT.

For some time past a number of patients have been in the habit of asking for Chaulmoogra oil of their own accord, and continuing its use for months. I have come to the conclusion therefore that they must gain some benefit from it, or they would not go on using it so persistently; for, as a rule, lepers very soon tire of any line of treatment.

It therefore seemed that the statements of some of the more intelligent patients might be of value, if taken with other data. As far as possible I have avoided leading questions, in getting answers from the patients. Table XVII. shows the dose of the oil, length of administration, state before and after using it, and the patient's statement. The number examined was eighteen.

The chief results may be summed up thus:—

1. Increase of perspiration. (One patient, however, said he perspired less.)
2. Decrease of tubercles.
3. Improved appetite and sense of well being.
4. Increase of sensation.
5. Increased suppleness of skin and lessening of pains in joints.

These patients have tolerated the oil with very little trouble, though in one or two there was vomiting. They have drunk it pure and not enclosed in capsules.

That the oil is of value in some cases I have no doubt. I know a private patient who has been taking Chaulmoogra capsules for the last six years. At one time he was taking 75 drops a day, but is now taking only 45 drops. He has certainly improved very much since I first saw him five years ago. The face is clear. There are one or two lumps in the lobes of the ears, and a few small reddish patches on the thighs. Tubercular outbreaks are far less common than formerly, and he is able to do a great deal of riding.

It must, however, be remembered, in estimating the value of the oil, that tubercles may often disappear spontaneously for a time in a patient without any treatment whatever. On the other hand tuberculation may advance whilst the patient is taking the oil, and yet he may experience relief in spite of the progress of the disease.

10. CREOLIN IN LEPROSY.

Creolin, like all new drugs, has been tried for nearly every disease during the last year or two.

Washbourn (Guy's Hospital Reports, Vol. XLV., 1888) has found that it is able to hinder and almost entirely prevent the development of anthrax bacilli in the blood of a living animal, and that in the proportion of 1 in 40,200 it has a deterring influence on the growth of anthrax bacilli on gelatine, whilst the presence of Creolin in the proportion of 1 in 19,100 prevents their growth altogether.

As I have not yet succeeded in getting an undoubted growth of the leprosy bacillus I have not been able to test the drug in this way, but during the year I have been using Creolin (Jeyes) extensively at the Leper Asylum, and find it very superior to carbolic acid. Its chief advantages are these:—

In leprosy ulceration

1. It reduces the smell of the gangrene, without the sickening combination of the smells of carbolic acid and gangrene.
2. It rapidly promotes the growth of healthy granulations.
3. It does not roughen the hands of those dressing the ulcers.
4. There is no danger of poisoning by absorption.
5. It is about half the price of carbolic acid.

Creolin is also very useful for the eczema so often complicating leprosy. It promotes rapid healing, and patients ask specially for it. Applied pure to ulcerating tubercles and exuberant granulations it is useful as a caustic.

I have tried it internally in the form of pills, in some of the patients at Cocorite, but have not noticed any definite results after its employment.

11. THE TREATMENT OF PERFORATING ULCER IN LEPROSY.

I have spoken elsewhere (Report for 1887 and *Lancet*, Sept. 17, 1887, p. 593) of the treatment of perforating ulcer by stretching the external popliteal or great sciatic. This is followed by good results in many cases, especially when the ulcer is accompanied by pain in the course of the nerves.

During the past year I have tried in several cases another mode of treatment which is simpler, and is often efficacious. It consists in passing a bistoury through from the ulcer on the sole of the foot to the dorsum, and cutting straight forwards through all tissues, bringing the bistoury out between the toes. The incision is then stuffed with lint to arrest hæmorrhage and prevent immediate closure of the wound, which is then left to granulate up from the bottom. If the ulcer should happen to be near the inner or outer side of the foot, the knife can be brought out on either of these surfaces as the case may be.

Subjoined are a few examples:—

CASE I.—Imamkhan, Hindu, aged 49, has suffered from anæsthetic leprosy for thirteen years.

Jan. 3, 1890.—Perforating ulcer of right foot. Bistoury passed through to dorsum and all tissues slit up forward to between toes. Wound stuffed.

Jan. 8.—A little swelling of dorsum.

Jan. 27.—Wound opened up again and some dead tissue scraped away.

Feb. 1.—Incision granulating up from bottom. Still some pain in foot.

CASE II.—Kheekhai, Hindu, aged 40, suffering from anæsthetic leprosy for two years.

May 8, 1889.—Left foot swollen. Sinus between fourth and fifth toes incised. Much granulation tissue scraped away. Bone too firm to come away.

May 22.—Foot still swollen. Loose head of metatarsal removed from between last two toes. Wound plugged with lint.

May 24.—Abscess has burst on dorsum. Probe passed from this to sinus between toes and all tissues slit up. Wound stuffed with lint.

Feb. 1, 1890.—Incision firmly healed with the exception of small ulcer on third toe. No pain or swelling.

CASE III.—Kalassar, Hindu, aged 35, suffering from anæsthetic leprosy for five years.

January 8, 1890.—Left great toe amputated

January 13.—Sinus opening on sole near stump. Probe passed through to dorsum and all tissues slit forward. Incision stuffed with lint.

February 1, 1890.—Incision nearly healed. Granulating surface where toe was amputated. No sinus or dead bone.

CASE IV.—Boolai, Hindu, aged 42, suffering from anæsthetic leprosy for six years.

August 21, 1889.—Two perforating ulcers on left sole: one between first and second toes, the other between third and fourth. Bistoury passed through to dorsum in each case and tissues slit forward. Incision stuffed with lint.

August 28.—Head of first metatarsal removed.

August 30.—Left great toe amputated circularly.

September 9.—Fragment of bone removed.

October 2.—Fragments of second metatarsal removed.

November 1.—More fragments removed.

February 1, 1890.—Both incisions firmly healed. Thick cicatrix. No pain.

CASE V.—Seeboo, Hindu, aged 44, suffering from anæsthetic leprosy for seven years.

June 15, 1889.—Perforating ulcer of right foot. Probe passed through to dorsum and counter opening made.

July 29.—Bistoury passed through and all tissues slit forwards to between toes. Incision stuffed with lint.

August 5.—Granulating well. No pain. Another sinus slit up.

August 16.—Necrosed head of bone loose. Removed. Granulations look healthy.

August 21.—Incision healing well from bottom.

February 1, 1890.—Incision firmly healed. Long thin cicatrix. Chronic ulcer still on sole in old place: not perforating. No pain.

CASE VI.—Edward Rawlins, negro, aged 30. Suffering from anæsthetic leprosy for five years.

August 16, 1889.—Perforating ulcer of left foot. Bistoury passed through to dorsum and tissues slit forward. Fragments of bone removed. Wound stuffed.

September 13.—Incision granulating at bottom. Sides cicatrizing.

December 6.—Perforating ulcer of right foot. Probe passed to dorsum and all tissues slit forward with bistoury. Incision in left foot has healed well. Deep groove and firm cicatrix at bottom.

December 12.—Fragment of bone removed from stump of right great toe. Small piece of dead bone removed from left dorsum.

January 3, 1890.—More fragments removed.

February 1.—Left foot: incision healed up from bottom, leaving deep groove. Some sinuses further back.

Right foot: deep groove in site of incision. Some ulceration at bottom of groove and on dorsum. Some pain in foot.

CASE VII.—Cheenaghan, Mussulman, aged 36. Suffering from anæsthetic leprosy for six years.

June 3, 1889.—Ulcer has perforated through to dorsum of left foot.

June 7.—Probe passed from dorsum to sole and all tissues slit forward through one toe. Wound plugged with lint.

November 20.—Sinus near little toe incised and numerous loose fragments of bone removed.

December 3.—Commencing gangrene of foot. Sinus slit up and numerous fragments of dead bone removed. Wound stuffed.

December 6.—Granulating well.

February 1, 1890.—One incision firmly healed between last two toes. Other incision on outer side of foot is granulating up. Another sinus is forming further back.

CASE VIII.—Mongroo, Hindu, aged 35. Suffering from anæsthetic leprosy for five years.

August 12, 1889.—Perforating ulcer of left sole. Bistoury passed to dorsum and tissues slit up forward. Wound stuffed with lint.

August 19.—Has lost middle toe from gangrene.

August 21.—Granulating well.

August 30.—Head of metatarsal and other fragments of bone removed.

October 25.—Incision healed up, but perforating ulcer is still left. Bistoury passed through to dorsum again and operation repeated. Fragments of skin cut away with scissors.

February 1, 1890.—Incision nearly healed. Still some granulations at upper part where toe was lost.

When we remember that perforating ulcer is a trophic lesion associated with distinct changes in the nerve trunks higher up, the measure of success attained in the above cases is somewhat surprising. It is true that in Case VIII. the perforating ulcer returned in two months, and had again to be dealt with, but up to the present time—three months after the second operation—it has not returned again. In Case V. a chronic ulcer has appeared in the sole in the site of the old perforating ulcer, but it has not yet begun to perforate. In Case VI. there is still ulceration on the dorsum of the foot, and in Case VII. another sinus is forming further back. It is possible that these may develop later into perforating ulcers. It is difficult to give a *rationale* for the success of the operation, but it seems to promise well and is worth trying further. In cases where the perforating ulcer returns, it may be well to repeat the incision in conjunction with nerve stretching. The operation, though at first sight it may appear somewhat heroic, is only a modification of the well-known surgical practice of laying open a sinus and stuffing it, so that it may granulate from the bottom.

12. ADDISON'S DISEASE ASSOCIATED WITH SYPHILIS AND LEPROSY IN A HINDU.*

As far as I have examined the literature of the subject I have found no record of Addison's disease in dark skinned races. Vandyke Carter† says that all the supra-renal capsules examined by him in lepers were healthy.

P., aged 50, a Hindu, was admitted to the Trinidad Leper Asylum on June 7th, 1884, with tuberculated leprosy of five years' duration. His skin was very dark but not more so than that of many East Indians, and the pigmentation was evenly distributed. The skin was very rough and dry and he complained of a constant itching, to relieve which he used to scrape himself with an old razor. The nose was sunken from former destruction of bone. The right eye had been lost in Calcutta from injury. During his stay in the Asylum he suffered on one occasion from violent pain in the back which soon passed off. He gradually became blind from leprous invasion of the cornea. He became extremely weak; sordes formed on the tongue and lips, and he died without definite symptoms on April 1st, 1889.

A necropsy was made next day, sixteen hours after death, with the following result:—Body rather wasted, nose sunken, skin dark and rough. No extra pigment in axillæ or groins. Fingers thickened, commencing ulceration at tips. Leprous thickening of the skin of the face. Scars on prepuce with contraction of the orifice, and resulting phimosis, much pigment on inner surface of foreskin and on glans. Dark line along inner surface of lips and on gums, but gangrene and ulceration were beginning in the mouth. Median nerves thickened above wrists. Epiglottis ulcerated and tip destroyed. Darkening of mucous membrane above epiglottis. Uvula nearly sloughed away. Ulceration and commencing gangrene of fauces. Thickening and ulceration of larynx. Both pleuræ rather adherent; several ounces of fluid in the left pleura. Lungs rather œdematous at bases. Weight of spleen 8 oz.: simple hypertrophy. Weight of kidneys 8 oz.: cystic. Old gumma on upper surface of liver with some puckering. Supra-renal bodies converted into sacs about two inches long, and lined with brown débris and small yellow grains looking like minute tubercles. No trace of medullary portion. Capsules lying in much fat. Ganglia of aortic plexus about three quarters of an inch long and dark red in colour. The microscope failed to show bacilli in the supra-renals or ganglia. Stomach and intestines healthy. Weight of brain 38 oz.: normal. Much dark brown pigment in the pia mater over medulla and upper part of cord. Some pigment in dura mater, above superior longitudinal sinus. Weight of heart 10 oz.: post mortem staining. Femoral glands enlarged. No scars in groins. The capsules were sent to the Pathological Society.

Besides being a leper this patient was the subject of well-marked syphilis as shown by the destruction of the nasal bones, the ulceration and loss of substance in the fauces and epiglottis and the gumma in the liver. Two of the three chief factors in Addison's disease were also present, viz.: destruction of supra-renal bodies, and progressive asthenia. So remarkable was the sac-like condition of the capsules that when I first cut into them as they lay surrounded by fat in the abdomen I thought I was opening bile-stained intestine. The gradual dissolution without marked symptoms was also very characteristic;

* Published in the *Lancet*, Aug. 3, 1889, p. 214.

† "Leprosy and Elephantiasis," p. 79.

during the last few days, however, the patient sank more rapidly. As regards the pigment I cannot speak so positively. The darkening about the mouth and fauces was not worth much for gangrene was beginning, and moreover pigment in these situations is not uncommon in negroes. Spirit also almost destroyed the dark colour. But on the glans and inner surface of the prepuce and in the pia mater over the medulla and upper part of the cord the pigment certainly seemed increased. There was also a little on the cerebral dura mater. As regards the skin, when one considers the very different shades presented by Hindoos, the pigment could not be called abnormal. Whether the changes in the capsules could be attributed in this case, to leprosy, syphilitic, or tubercular lesions is a difficult question. No leprosy or tubercle bacilli were found in the supra-renals, or in the abdominal sympathetic, nor were there any tubercles in the lungs or elsewhere. Whatever changes had been going on in the capsules seemed to have reached the last stage, for the medullary substance was quite destroyed and there was only a trace of cortex in each capsule. Judging from the loss of substance which had followed syphilitic lesions in other parts of this patient's body it is at any rate possible that the destruction of the supra-renal bodies may have been caused by the breaking down of gummatous deposit. Barlow² has described a case of atrophy of the supra-renal capsules associated with gummata of kidney and refers to fibroid and other changes in the supra-renals noted by Charlewood Turner and others in the subjects of acquired syphilis. The condition of the capsules in the case described by Dr. Barlow is very similar to that now recorded.

13. REPEATED NERVE STRETCHING WITH RELIEF IN THE SAME PATIENT.

This case has been already alluded to (*Lancet*, September 17, 1887, p. 593, and *British Medical Journal*, December 22, 1888, p. 1378). Since then the operation has been repeated twice, and a few notes of the complete case may be of interest.

Henry Hart, coloured, aged 26, was admitted to the Asylum on February 7, 1882. He was attacked with anæsthetic leprosy in 1865.

December 15, 1886.—Painful ulcers on soles of both feet. Pain up legs and thighs in course of sciatics. Ulcers probed, but no dead bone felt.

December 17.—Pain continues. It is worse in ulcer of right foot than in that of left. At his own request the right sciatic was stretched. He took chloroform very badly.

December 20.—There is now no pain in either ulcer. Both look paler and inclined to dry up. A good deal of thin discharge from the incision in the thigh and some tension on the sutures, which were accordingly removed.

December 27.—Ulcer in right foot is quite closed and there is no pain in foot or leg. Incision in thigh is granulating well.

December 29.—Patient is walking about. Appetite has so much increased that he asks for extra food.

February 21, 1887.—Now complains of great pain in right sole. Asks for amputation of leg. Small sinus found to inner side of great toe, but probe detects no dead bone. There is intense hyperæsthesia. He was given chloroform and an incision about two inches long was made in the centre of the sole. A probe was passed along the sinus and the tissues slit up at right angles to the longitudinal incision. No pus or dead bone was found. The right external popliteal was stretched at the same time. It looked white and glistening.

February 23.—Much less pain to-day. Suture removed from incision over external popliteal.

February 25.—Suppuration about incision over popliteal. Slight hæmorrhage from foot. Can bear foot touched now.

March 4.—Incisions in foot and leg nearly healed. A little pain in foot.

August 5.—No pain except sometimes when he walks. Still has a small ulcer on sole.

May 3, 1889.—Ulcer of right foot is again painful. An incision was made in the old cicatrix and the right external popliteal stretched again. At his own request no chloroform was given. He bore the operation very well and says he only felt pain when the knife got through the skin. The ulcer of the foot was also incised.

May 6.—Pain less. Sutures removed. Has not yet tried to put the foot to the ground.

May 15.—Foot still painful and swollen. Ulcer incised and fragments of bone removed. Suspicious looking swelling over tubercle of tibia. Pain worse at night. Ordered Potass Iodid, gr. x., Tinct. Cinchonæ Co. m. xxx. Aq. ad 1 oz. t. d.

June 7.—Pain less. Has begun to walk a little. Tendons at back of knee rather stiff from want of exercise.

July 7.—Ulcer in right foot painful again.

July 23.—Ulcer still painful so patient was given chloroform and the right sciatic was stretched again, the incision being made through the old cicatrix. He took chloroform very badly and became very blue.

* Path. Soc. Trans., Vol. XXXVI., p. 433.

July 26.—Sutures removed. Some pain on pressure near incision, also over site of former incision over external popliteal, and over ulcer of foot. There has been some bleeding from incision. Ulcer of foot looks about the same.

July 29.—Free discharge from incision. Occasional pain down leg.

July 31.—Ulcer nearly healed. Complains of dragging pain at back of heel as if tendon were being constantly dragged.

August 19. Ulcer firmly healed, but there is still pain at ankle.

August 28.—Pain at ankle has been removed by a blister, but foot is still weak.

September 4.—Has walked for half an hour. Foot stiff next day.

September 9.—Foot painful again. Ulcer beginning to break out.

October 30.—Ankle still painful after he walks about, but not when he keeps quiet.

From the above it will be seen that the great sciatic and external popliteal nerves were each stretched twice in this patient. Each time there was considerable relief after the operation. The good effect passed off most quickly after the first operation, lasting then only two months. This may be because the operation in December, 1886, was one of the earliest of my series, and was not so thoroughly carried out as some of the later operations which were done after more practice. The interval from the second to the third operation is a long one, viz., from February, 1887, to May, 1889, a period of two and a quarter years. This third operation though it gave temporary relief never entirely removed the pain, and a fourth operation—this time on the great sciatic again—was performed two months later. From that time to the present there has been steady improvement.

On no occasion when either nerve has been exposed in this patient have I found any naked eye change, and this may explain the relief obtained by operation. Arning (Virchow's Archives, 1884) finds bacilli much less frequent in the nerves in anæsthetic leprosy than in the other two forms. In my experience they are about equally common (*vide* Report for 1887). Leloir (op. cit., p. 228) raises the question whether the bacilli completely disappear in old cases of anæsthetic leprosy. Certainly they are very rare in the viscera in such cases. Thus in the Report already quoted I only found them three times in the viscera (twice in the liver and once in the spleen) out of a total of thirty-two occurrences in various viscera.

If bacilli gradually dwindle away in old anæsthetic cases, there is of course more hope for the surgeon. However this pathological point may eventually turn out, the above case together with another which I have quoted elsewhere (*Lancet*, loc. cit.) seems to establish the fact that nerve stretching may be indefinitely repeated in the same patient and on the same nerves with good hope of relief. However often the operation may have to be repeated for painful perforating ulcer, it is certainly preferable to the amputation which these unfortunate patients often beg for.

14. SEQUELS TO TWO CASES OF AMPUTATION FOR LEPROTIC GANGRENE.*

In the *British Medical Journal* for March 7, 1885, p. 434, I published two cases of amputation for leprotic gangrene. Both these patients have since died from other causes, and a few notes on the post mortem appearances may be of interest.

CASE I.—P., Hindu. *Æt* 20, admitted May 31, 1878. Anæsthetic leprosy of two years duration. Amputation through thigh on March 7, 1884. Stump healed by June 5. Died December 20, 1889. Body wasted, stump firmly healed. Some atrophy of median nerve. A few pleuritic adhesions.

Spleen 24 oz.: simple hypertrophy. Kidneys 7 oz., capsules adherent. Cortices thinned and blurred. Dark purple patches of congestion on mucous membrane of large intestine. Small ulcers in places. Magenta showed no bacilli.

CASE II.—J. S., Portuguese, *Æt* 25. Admitted January 20, 1877. Anæsthetic leprosy of eleven years' duration. Amputation through knee joint on April 18th, 1884. Stump never entirely healed. Died February 17, 1886. Superficial ulceration of hands, nose and neck. Healthy granulating surface about 3 x 2 inches. Tip of epiglottis ulcerated away. Vocal cords replaced by a granulating ragged mass. Slight pleuritic adhesions towards left apex. Pleuro-pneumonia at right base with a few small abscesses. Several ounces of bloody fluid in right pleura. Spleen 30 ounces: simple hypertrophy. Magenta showed numerous bacilli in larynx, femoral gland, and testes.

In each case the patient appeared to be almost *in extremis* when amputation was performed, and the further history of the patients is of interest as showing that life was prolonged in the first patient for five years and nine months, and in the second case for one year and ten months. Death in the first case occurred from mixed kidney and dysentery, and in the second from pleuro-pneumonia, probably of embolic origin. Pyæmic infarction is common in tuberculated lepers when absorption and ulceration of tubercles set in towards the end. The cases only serve to emphasize what I have often said before, that very much may be done by operative interference in leprosy even in apparently desperate cases.

* Published in *British Medical Journal*, March 1, 1890, p. 477.

15. THE KIDNEY LESIONS IN LEPROSY CONSIDERED IN RELATION TO THE SKIN CHANGES.*

Few facts are better known than the correlation in the secretions of the skin and kidneys. A lesion of one of these organs is therefore of pathological interest as regards the other, and it seems worth while to examine the question in the case of leprosy, a disease which though now classed as an infective granuloma presents such varied and important skin lesions.

Death from kidney disease has long been known to be a common termination in leprosy. I do not find however that the condition of the kidneys has been sufficiently analysed; nor has any attempt been made to trace a connection between the extent or severity of the skin lesions and the renal changes.

Carter† says that in fifteen autopsies the kidneys were six times noted as large, six times small, and three times normal in size. He also gives the result of minute examination in seven cases, but in only three of these did the changes indicate distinct chronic nephritis.

Danielssen and Boeck‡ say of tuberculated leprosy: "Les reins sont presque constamment plus ou moins attaqués si la maladie a duré longtemps, si même les autres organes internes sont demeurés tout à fait intacts. La capsule des reins est souvent revêtue de petits tubercules, la substance renale est aussi plus ou moins affectée." After describing the changes they continue: "Nous ne doutons aucunement que chacun ne soit porté à reconnaître dans ces alterations celle de la nephrite albumineuse, si parfaitement décrite et représenté par Rayer."

Under the head of anæsthetic leprosy they say: "Les alterations sont les mêmes que celles constatées par nous sous la forme tuberculeuse, seulement nous avons remarqué ici deux fois une grande quantité de cystides formés surtout dans la substance renale."

I may remark here that I have never found the tubercles on the capsule described by these authors; that I have in one of two cases found cysts which did not appear to differ from those found in non-leprous cases.

Bidenkap § seems to regard the kidney changes as specific and says that albuminuria is not uncommon in tuberculated leprosy.

Hillis || gives albuminous nephritis as causing 22·5 per cent. of the deaths in tuberculated leprosy while in anæsthetic leprosy he mentions dropsy as a cause of death in 11 per cent. of the cases, but says that it is not dependent on nephritis.

Cornil and Babes¶ do not seem to recognise the ordinary forms of chronic nephritis in leprosy but describe albuminous nephritis as coming on together with lardaceous changes in other viscera as the result of ulcerations of the skin and mucous membranes. They also state that the bacillus lepre may invade the kidneys, together with all the tissues of the body without producing any naked eye change.

Though from personal experience I am more or less able to confirm all the above descriptions, they seem to me somewhat vague. I cannot pretend to throw very much light on the question, but I have thought that a short statistical table may be of some value. At the same time it suggests a few remarks.

During the past five years I have made seventy-eight autopsies on lepers at the Trinidad Leper Asylum of whom 23 or 29·4 per cent. showed some form of nephritis. I have purposely omitted other renal changes occurring in the course of general visceral lesions such as lardaceous degeneration, pyæmic infarction and syphilitic and tuberculous deposit. Sometimes, however, these changes have occurred in addition to the chronic nephritis.

Subjoined is a condensed Table of these twenty-three cases:

* Published in the *British Journal of Dermatology*, May, 1889.

† *Leprosy and Elephantiasis*, p. 78.

‡ *Traité de la Spédalskhed*, pp. 226, 289.

§ *Lectures on Leprosy*, p. 47.

|| *Leprosy in British Guiana*, pp. 39, 111.

¶ *Les Bactéries*, p. 769.

Comparative Table of skin and kidney lesions in the Trinidad Leper Asylum.

No.	Age.		Birthplace.	Form of Leprosy.	Years Afflicted.	State of Skin.	State of Kidneys.	Weight of Kidneys.	Bacilli.	Remarks.
	M.	F.								
1	60	...	China	A	?	Advanced anaesthesia	...	Not noted	Not noted	Kidneys contained gummata.
2	23	...	India	T	?	Tuberculation of face and extremities	...	4 oz.	Not noted	
3	21	...	Trinidad	M	9	Tuberculation of face and legs. Dry scaly eruption of trunk and extremities. Anaesthesia of both hands back of right hand	Contracted Large. White	18	Not noted	Died rapidly after healing of tubercular ulcers of legs.
4	...	23	Trinidad	T	10	Sloughing ulcers both feet and back of right hand	Large. White	18	Not noted	
5	19	...	Trinidad	T	7	Tuberculation of face, swelling and ulceration of fingers	Mixed	...	None	Died suddenly. Several fits before death
6	...	30	Trinidad	T	7	Tuberculation of face. Skin of trunk and extremities rough, thickened and scaly. Toes ulcerated	Large. White	13	None	
7	25	...	Trinidad	T	9	Large masses of tubercle on face. Nipples tuberculated. Superficial ulceration of face and extremities	Large. White	13	None	
8	47	...	India	A	23	Anaesthesia from elbows and knees downwards. Anaesthetic patches scattered over rest of body	Large. White	11	None	
9	33	...	India	A	?	Commencing gangrene of left foot and wrist	Large. White. Mottled with fatty patches and hemorrhages beneath pelvis, and in cortices	14	None	
10	15	...	Trinidad	T	7	Ulceration of face. Slight thickening of lobes of ears. Ulceration and commencing gangrene of fingers, legs, and feet	Large. White	13	None	
11	17	...	Trinidad	T	7	Tuberculation of face. Some of tubercles ulcerated. Hands and feet free	Acute nephritis. Tubules stuffed with blood corpuscles, granular cells and debris	Right 8 Left 2	None	Congenital atrophy of left kidney. Rapid oedema, and death in three days. (Path. Soc. Trans., Vol. XXXVII. p., 286.)

No.	Age.		Birthplace.	Form of Leprosy.	Years Afflicted.	State of Skin.	State of Kidneys.	Weight of Kidneys.	Bacilli.	Remarks.
	M.	F.								
12	23	...	Trinidad	T	12	Ulceration of body and extremities. Commencing gangrene of fingers	Mixed	...	None	
13	...	18	Trinidad	T	5	Tuberculation of face and arms. Ulceration of face	White	...	None	
14	48	...	Trinidad	A	34	General anesthesia. All fingers gone and many toes	Mixed	...	None	
15	54	...	Africa	A	25	General anesthesia. Some absorption of phalanges of fingers	Contracted	...	None	
16	27	...	Trinidad	A	17	Anesthesia of extremities. Spontaneous amputation of fingers and toes	Mixed	...	Not noted	
17	...	12	Trinidad	T	3	Tuberculation of face and extremities. Trunk free. Orifices of several ducts on upper extremities clogged with dirt	Large. White	...	None	Kidneys contained pyemic infarcts
18	19	...	Trinidad	A	15	Anesthesia of extremities. Old amputation of fingers and toes	Large. White	...	Not noted	
19	46	...	India	A	?	Scaly eruption over shins and knees. Skin coarse and wrinkled over upper extremities and trunk. Sensation everywhere except two little fingers	Mixed. Also contained cysts	...	None	
20	16	...	Trinidad	T	8	Tuberculation of face and extremities	Large. White	...	None	
21	51	...	Trinidad	A	14	Anesthesia of extremities. Old amputation of fingers and toes	Mixed	...	None	
22	57	...	India	M	19	Anesthesia of extremities. Skin of whole body wrinkled and most of tubercles absorbed. Healed ulceration	Contracted	...	Not noted	
23	...	23	Trinidad	T	8	Tuberculation of face and extremities	Contracted	...	None	

A further analysis of these cases is given in the following two Tables :—
TABLE SHOWING THE NUMBER AND VARIETY OF KIDNEY LESIONS OCCURRING IN
THE DIFFERENT FORMS OF LEPROSY.

Form of Leprosy.	Acute Nephritis.	FORM OF KIDNEY DISEASE.			Total.	
		Large White Kidney.	Mixed Kidney.	Contracted Kidney.		
Tuberculated ...	...	1	7	2	2	12
Anæsthetic ...	...	...	3	5	1	9
Mixed ...	...	...	1	1	...	2
Total	...	1	11	8	3	23

TABLE SHOWING THE AVERAGE DURATION OF THE DIFFERENT FORMS OF LEPROSY
IN THE ABOVE FORMS OF KIDNEY DISEASE.

Form of Leprosy.			Acute Nephritis.	FORM OF KIDNEY DISEASE.		
				Large White Kidney.	Mixed Kidney.	Contracted Kidney.
Tuberculated	...	...	7	7	9½	8
Anæsthetic	...	...	...	19	21½	25
Mixed	...	...	...	9	19	...

Total average duration of Leprosy—12½ years.

Two questions naturally present themselves in these cases :—

1. Are these forms of kidney inflammation set up by specific leprous deposit, or are they identical with those occurring in non-leprous cases, and probably due to interference with the functions of the skin?

2. What is the relation between the different forms of diseased kidney found in leprosy?

With reference to the first question, I have examined microscopically kidneys from forty-nine different lepers and have found the bacillus lepræ in only two cases, both of mixed leprosy. In one case of fifteen years' duration, bacilli were found in liver, spleen, and kidney, besides larynx, median nerve, and femoral gland. The liver weighed five pounds fourteen ounces; the kidneys fourteen ounces, and the spleen fifteen ounces. The kidneys shewed no inflammatory change. In the other case the leprosy was of eleven years' duration and bacilli were found in liver and kidney. The kidneys here weighed six ounces, and showed no sign of inflammation.

This very low percentage of occurrences of bacilli in the kidneys goes far I think to exonerate, at any rate in the majority of cases the bacillus lepræ from being a direct cause of the kidney lesions.

We have now to examine the state of the skin with reference to this question.

There is I suppose little doubt that the first signs of the invasion of the bacillus in each form of the disease show themselves in the skin. Hence the cutaneous changes may be taken as a fair index of the duration of the disease.

Taking first the one case of acute nephritis occurring in a tuberculated leper we find the duration of the leprosy to have been seven years. This case, moreover, hardly comes fairly within the scope of the present inquiry for the left kidney was congenitally atrophied,

weighing only half a drachm, and probably the acute attack was partly caused by the almost double work which had to be done by the right kidney. This case has already been published.*

Next in order come the seven cases of large white kidney occurring in tuberculated lepers. In one case the duration is not known but the average calculated on the other six cases comes to exactly seven years again.

In the two cases of mixed kidney in tuberculated lepers the average is nine and a half years.

In one case of contracted kidney the duration is not known, in the other it is eight years.

Coming now to anæsthetic cases we find that for one large white kidney the duration of the leprosy is not known, but the average for the other two comes to nineteen years.

In the one case of contracted kidney the duration is twenty-five years, whilst the cases of mixed kidney (two having an unknown duration) give an average of twenty years and two-thirds.

The one case of large white kidney occurring in a mixed leper shows a duration of nine years, whilst the same form of leprosy associated with mixed kidney had lasted nineteen years.

The mean average duration of the leprosy calculated on the eighteen cases of kidney disease in which the duration of the skin disease is known comes to twelve years and eight months.

Now the mean duration of all forms of leprosy calculated from the Asylum records is eight and a half years. It would seem therefore that the cases of kidney lesion run a more chronic course than the other results or complications of leprosy.

Unfortunately I have not exact notes as to the commencement of albuminuria and dropsy in the various cases, but this I may say, that when marked dropsy comes on death is usually not long in following, in some cases occurring quite suddenly. This was very marked in No. 3 and seemed due to sudden increase of work thrown on the kidneys by the rapid healing of some tuberculated ulcers of the legs.

One point is very noticeable, viz., the much longer duration of life in cases of kidney disease associated with anæsthetic leprosy. This fact fits in well with our knowledge of the skin lesions in leprosy. In the tuberculated form the new growth begins in the connective tissue in and around the sweat glands, while in anæsthetic leprosy the nerves are first affected and the changes in the sweat glands are secondary and of less severity. The strain thrown on the kidneys is therefore more gradual than in the tuberculated form where a sudden eruption of tubercles may permanently damage a large number of sudoriparous glands, and make an equally sudden demand on the secreting structure of the kidney.

With regard to the second question these statistics are unfortunately too scanty to warrant any safe conclusions as to the relation of the large white to the mixed and contracted kidneys. It is, however, a suggestive fact that the longest anæsthetic case, viz., of thirty-four years, showed mixed kidneys, and the next longest case, twenty-five years, showed contracted kidneys, while mixed kidneys were found also in anæsthetic cases of seventeen and fourteen years' standing.

Following Ziegler's† nomenclature it would appear that these kidneys are only stages of one disease. He traces chronic parenchymatous nephritis through the resulting atrophy of secreting structures to cicatricial contraction and the secondary contracted kidney. As far as the above statistics go they seem to support this view. The cases of shorter duration show for the most part chronic parenchymatous nephritis or large white kidney, while the longer cases in which the skin affection has been more gradual show either commencing cicatricial contraction (mixed kidney) or the secondary contracted kidney, the final link in the chain of events.

NOTE.—Since writing the above I have found it stated by Leloir (op. cit., p. 256) that Armauer Hansen considers that the changes found in the lungs, intestines, bronchi, brain, and spinal cord of lepers are tubercular, not leprous. He has never found leprous changes in the kidneys. As stated above I have only twice found leprosy bacilli in the kidneys, so that my experience approaches his. The lesions in the lungs and other viscera in cases of leprosy I shall discuss at a future time.

16. A CASE ILLUSTRATING THE DIFFICULTY IN DIAGNOSIS BETWEEN CONGENITAL SYPHILIS AND EARLY LEPROSY.

Israel B., Hindu, aged 8, was transferred from the Tacarigua Orphanage to the Leper Asylum on May 31, 1889. I had previously examined him and felt sure that he was suffering from very early leprosy.

The following notes were made shortly after his admission :—

Face earthy looking. Numerous slightly raised tubercles on cheeks, upper and lower lips and chin. One above labella. Tubercles not copper coloured.

* Pathological Society's Transactions, Vol. XXXVII., p. 286.

† Special Pathological Anatomy, Cap. LXIX, Art. 546.

Three small tubercles over back of neck. Numerous similar small tubercles on extremities also scaly patches. No anæsthesia except over some of these patches on the upper extremity. Toes rather swollen. Femoral glands slightly enlarged.

Patient looks very sallow and confesses to having been a dirt-eater. The tubercles are said to have come out less than a month ago.

June 14.—He was ordered single doses of Santonin and Castor oil, five grains of Grey Powder three times a day, and for external use a liniment of equal parts of Creolin and lime water.

June 19.—Has been vomiting. Tubercles on face look smaller, also taches on legs. It was noticed to-day that the teeth looked suspicious, being slightly notched.

June 24.—Gums a little sore. Loss of appetite. Tubercles have diminished on face and legs. Grey Powder to be stopped.

July 3.—No tubercles to be seen on face. Swelling of legs less and taches desquamating. Anæsthesia less. Repeat Grey Powder.

July 7.—Only took the Grey Powder for three days as it produced vomiting. Now very pale. Tongue white. All tubercles gone. Pale, shining, scaly patches on extremities. Sites of former tubercles can be seen on fingers. Ordered Wine 2 ozs. and 2 Eggs.

July 22.—Large ulcer on right side of mouth. Ordered Chlorate of Potash and Glycerin to wash out the mouth.

August 7.—No trace of tubercles. Taches on legs desquamating. No anæsthesia. Has begun rubbing with Mercury Ointment.

August 16.—Skin loose and flabby; earthy looking. Eats hardly anything.

August 19.—Was found to be eating plaster from the walls of Ward 3, so he was transferred to the Infirmary where the walls are painted. He is already looking better. On the scaly patches there is no anæsthesia. The Mercury stains the skin very dark, bringing out the pale taches.

September 4.—Much better. Face filled out. Stouter. A little thickening still on some fingers. Taches disappearing. Is only having frictions.

September 9.—Fever.

September 16.—Fever gone but face looks unnaturally swollen.

October 2.—Much stouter. Face filled out. Legs scaly.

November 29.—Face swollen again. Lveral fresh tubercles have come out in chin and cheeks. Was put on Chaulmoogra internally and externally.

This case illustrates well the difficulty which sometimes arises in diagnosis. When I first saw the patient before his admission I had no doubt of the nature of the disease. The rapid disappearance of the tubercles under Mercury however made me waver, especially when taken with the suspicious appearance of the teeth. I may state here that the child was only twelve days old when admitted into the Orphanage, so that no family history could be obtained.

Radcliffe Crocker writing on this subject (*Diseases of the Skin*, p. 475) says: "Leprous tubercles have their special seat of predilection; those of syphilis are indiscriminate and may come where leprous tubercles never or rarely appear. Moreover the tubercles of syphilis are not grouped, have a characteristically depressed centre after a time, and run a more acute course, whether they become absorbed or break down."

Though the tubercles in this case were in the ordinary sites of leprosy tubercles, the steady improvement of the patient led me to hope I had been mistaken in my original diagnosis, and I had even begun to think of sending the boy back to the Orphanage, when an outbreak of fever occurred on September 9, followed by swelling of the face, and about two months later by a fresh crop of tubercles.

This course of events is unfortunately too characteristic to leave any further doubt, and the patient is now under Chaulmoogra treatment.

17. THE TREATMENT OF EARLY LEPROSY BY EXCISION OF TUBERCLES.

The treatment of tubercular leprosy by excision has been somewhat fully discussed in the Asylum Report for 1885, and also in an article in the *British Medical Journal* (June 9, 1888, page 1214). I do not propose therefore to add very much here to what I have already written, but simply to describe a very early case in which I had the opportunity of trying excision.

Ernest Berrington, Negro, aged 8, was admitted to the Asylum on June 3, 1899. I had previously seen him as a private patient, and urged his coming in for operative treatment.

His condition on admission was as follows: On the left cheek is an isolated circular mass of tubercles about $1\frac{1}{4}$ inches in diameter. Round it are small tubercles about the size of peas. On the nose and right cheek are several solitary tubercles the size of small shot.

There is a solitary tubercle of the size of a pea above the right elbow. The fingers are rather swollen.

The skin over the shins is tense and copper-coloured. There are several small tubercles in the left calf and above the left knee. Soles are anæsthetic. Femoral glands on both sides and axillary on right side are enlarged.

The disease began with an eruption of tubercles on the left cheek about eighteen months ago.

June 10.—Was given chloroform, and with a very sharp knife the mass of tubercles was shaved off the left cheek. Then fuming nitric acid was rubbed in and afterwards tannin applied. Thin small isolated tubercles on both cheeks, forehead, chin, both legs and above right elbow were similarly treated.

June 12.—Sites of isolated tubercles covered with scabs which have sunk in. On left cheek is a large scab, and some discharge. The sores are being dressed with pure Creolin.

Patient was ordered Liquor Hydrarg. Perchlor 1 dr. Inf. Quassie ad. 1 oz. t. d.

July 10.—Face nearly healed. But fresh tubercle has appeared under right eye and also under left eye.

From this date the tubercles have gradually increased both in the sites of excision, and elsewhere. On two occasions they have been inoculated with leprosy cultures (as described in another part of this Report) with the result of setting up a certain amount of ulceration in the tubercles but not materially checking their progress. At the present time the mass of tubercles below the left eye is ulcerating, and the tubercle above the right elbow is scabbed over, but still increasing.

I am always on the look out for early cases of leprosy, for it is to them that we must look for any success in treatment. I hoped that free removal with a sharp knife followed by the thorough rubbing in of fuming nitric acid, and the use of large doses of mercury internally might arrest the disease. Leloir (op. cit., page 319) has taken up the same idea that leprosy may be a purely local growth at first and so complete destruction of tubercles may prevent a general invasion of the economy. In favour of this I may cite my failure ever to find bacilli in the blood of lepers at any stage of the disease, or to cultivate them from leprosy blood. The treatment by excision will certainly be worth trying again, in a still earlier subject if possible.

18. THE TREATMENT OF TUBERCULATED LEPROSY BY RED IODIDE OF MERCURY OINTMENT.

Raymond H., Negro, aged 8, was admitted to the Asylum in September 16, 1889. He had been suffering from tuberculated leprosy for some years.

His state on admission was as follows:—Numerous tubercles of the size of small shot on forehead, cheeks, chin and ears. Few small pale brown patches on the back.

General swelling of forearms, hands and fingers, also of legs, feet and toes. Pale brown raised shining masses near elbows and knees. Sensation perhaps slightly lessened in fingers and toes, but this appears to be due to thickening of tissues. Cervical, axillary and femoral glands enlarged.

September 18.—Ordered Ung. Hydrarg. Iodid. Rubr. One application to be made to the whole body and extremities.

September 25.—Desquamating freely after one application. Number of separate tubercles on face and ears seems less. To have another application to-night.

September 27.—Face swollen: puffy below eyes. Not salivated.

October 2.—Not much change in tubercles of face since last time. Repeat ointment to-night.

October 16.—Small tubercles of face about the same, also swelling of extremities. Repeat ointment to-night.

October 23. Skin peeling from face and neck. Tubercles about the same. Hands and feet swollen. Not much evidence of ointment on extremities.

October 28.—Was rubbed with ointment again last night. Face a little swollen, but less effect than at first.

November 8.—Tubercles increasing on ears, cheek, forehead and chin. Repeat ointment to-night.

November 11.—Blisters on back from ointment. Face swollen. Some salivation. Tubercles have increased on face. Large lumps over angles of jaws.

As in this case the disease took the form of a general infiltration of the extremities, with a few small tubercles on the face, it was thought that a strong germicide ointment like red iodide of mercury might succeed in killing the bacilli and reducing the infiltration and tubercles. At first there seemed to be slight improvement, but after a few applications the ointment lost its caustic effect on the skin, though in the end salivation was set up and the remedy discontinued. Tuberculation is now progressing in the patient.

CONCLUSION.

It would be a work of supererogation to repeat the praises of the self-abnegation of the Dominican Sisters. From time to time they are attacked by those who should know better, and the charges made are always found on enquiry to be utterly groundless. The sickening work which the Sisters are constantly doing, and the unmerited insults which they so often endure without complaint from some of the most degraded inmates would long ago have caused women of lower calibre to turn aside from the work.

Much has been written and spoken of Father Damien, and rightly so, but these devoted women had begun their mission five years before he set out from Belgium, so that they are comparative veterans in the campaign of succour to

“This poor rib-grated dungeon of the holy human ghost,
This house with all its hateful needs, no cleaner than the beast,
This coarse diseaseful creature which in Eden was divine,
This Satan-haunted ruin, this little city of sewers”

(TENNYSON. 1889.)

Narrow bigotry assails them from time to time, but theirs is a work which rises superior to the petty distinctions of creed or nationality: it is in the truest sense humanitarian.

I have the honour to be,

Sir,

Your obedient Servant,

BEAVEN RAKE.

The Hon.

COLONIAL SECRETARY.

LITERATURE RECEIVED.

FROM THE GOVERNMENT OF TRINIDAD.—Manual of Bacteriology, Crookshank, 2nd Ed.; Diseases of the Skin, Radcliffe Crocker.

FROM DR. OHMANN DUMESNIL, ST. LOUIS, MO.—St. Louis Medical and Surgical Journal (monthly); Handbook of Skin Diseases; Dermatological Reprints.

FROM DR. WOLFRED NELSON, NEW YORK.—Five years at Panama; ²Yellow Fever (two pamphlets).

FROM DR. SAJOUS, PHILADELPHIA.—The Satellite (monthly).

FROM DR. P. S. ABRAHAM, LONDON.—Leprosy: a review of some facts and figures; The Etiology of Leprosy; Introductory Address at Westminster Hospital.

FROM DR. DANIELSEN, BERGEN.—Beretning om Lungegaardshospitalets Virksomhed i Treareet 1886-1888; Contribution à l'étude de la lèpre.

FROM DR. LEOIR, LILLE.—Essais d'inoculation de la lèpre aux animaux.

FROM DR. ARNING, GERMANY.—Eine Lepa-Impfung beim Menschen.

FROM DR. KNOTT, DUBLIN.—The Fever of over-exertion; Note on the “Fatigue Fever” of M. Peter.

FROM DR. DOCK, GALVESTON, TEXAS.—Leprosy, with a report on two cases.

FROM DR. LACAZE, GUADELOUPE.—De la Lèpre.

TABLE I.

General Statistics for 1889.

				Male.	Female.	Total.
Remaining in Asylum on December 31, 1888	...			135	43	178
Admitted during 1889	...	...	...	22	16	38
Discharged	...	...	...	8	13	21
Died...	...	...	...	10	6	16
Remaining in Asylum on December 31, 1889	...			139	40	179

TABLE II.

Comparative Statistics.

Year.	Admissions.	Discharges.	Deaths.	Remaining at end of year.	Percentage of Deaths.
1877	35	18	16	119	10.59
1878	36	21	17	125	10.96
1879	30	13	17	125	10.96
1880	45	20	18	133	10.58
1881	51	30	26	128	14.13
1882	51	26	18	136	10.50
1883	49	21	25	139	13.51
1884*	39	14	23	141	12.92
1885*	44	13	28	144	15.13
1886*	73	18	21	177	9.72
1887	65	36	30	176	13.39
1888	38	19	16	179	7.47
1889	38	21	16	179	7.40

* The falling off in the number admitted during 1884 and 1885 is due to the fact that the admissions were limited by the vacancies. The sudden increase in 1886 is owing to the opening of the Infirmary.

TABLE III.
Return of Admissions for 1889.

No.	Name.	Age.		Form of Leprosy.	Years Afflict'd.	Re- admitt'd	Country.	Late Residence.	Date of Ad- mission.
		M.	F.						
1	Thomas Gift ...	55	...	A	1	...	Barbados ...	Port-of-Spain ..	Jan. 12.
2	Rose Butler ...	21	...	A	15	Yes	Trinidad ...	Savana Grande ..	" 12.
3	Emily Oakes ...	56	...	A	32	Yes	Trinidad ...	Port-of-Spain ..	Feb. 2.
4	Ellen Applewhite...	17	...	T	1	...	Barbados ...	Port-of-Spain ..	" 9.
5	Kalassar ...	35	...	A	5	...	India ...	Port-of-Spain ..	" 20.
6	Angel Moore ...	28	...	T	3	...	Barbados ..	Couva ...	" 23.
7	Christopher Hall ..	42	...	T	1	...	Barbados ..	Port-of-Spain ..	" 26.
8	John Charles ...	43	...	A	14	...	Trinidad ...	Belmont ..	Mar. 2.
9	Henry Matthew ...	14	...	T	5	...	Trinidad ...	Port-of-Spain ..	" 2.
10	John Coryat ...	60	...	M	14	...	Trinidad ...	Carenage ..	" 8.
11	William Nelus ...	15	...	T	7	...	Surinam ..	Cedros ..	Apr. 10.
12	Manson Kennedy...	14	...	A	3	...	Trinidad ...	Couva ...	" 12.
13	John Pascal ...	17	...	T	3	...	Trinidad ...	Port-of-Spain ..	" 12.
14	Rufus Taitt ...	6	...	T	1 month.	...	Trinidad ...	Port-of-Spain ..	" 12.
15	Rheekhai ...	40	...	T	2	...	India ...	Chaguanas ...	May 8.
16	John French ...	43	...	A	11	Yes	Barbados ...	Mucurapo ...	" 10.
17	Fitzalbert Hunt ...	11	...	T	1 month.	...	Trinidad ...	Port-of-Spain ..	" 11.
18	Gangoo ...	47	...	A	3	Yes	India ...	Port-of-Spain ..	" 14.
19	Paul Macfarlane ...	45	...	T	1½	...	Trinidad ...	Port-of-Spain ..	" 16.
20	Jerome Flandinette	15	...	T	4	...	Trinidad ...	Port-of-Spain ..	" 16.
21	Israel Beaufort ...	...	...	M	1 month.	...	Trinidad ..	Tacarigua ...	" 31.
22	Ernest Berrington..	8	...	T	1½	...	St. Vincent ..	Port-of-Spain ..	June 3.
23	Julia Hargreaves...	15	...	T	1	...	Trinidad ..	Port-of-Spain ..	July 19.
24	Marie Leger ...	78	...	*	...	...	Dominica ...	Port-of-Spain ..	Aug. 19.
25	Angelina Adams ...	10	...	M	3	...	Trinidad ...	Port-of-Spain ..	" 19.
26	Florence Lewis ...	23	...	T	10	Yes	St. Vincent ..	Port-of-Spain ..	" 31.
27	Janetta Thompson..	21	...	T	3	Yes	Barbados ...	Port-of-Spain ..	" 31.
28	Louisa Lewis ...	31	...	A	19	Yes	Trinidad ...	Port-of-Spain ..	Sep. 12.
29	Raymond Hedley...	10	...	T	2	...	Trinidad ..	Tacarigua ...	" 14.
30	Kariman ...	45	...	T	2	Yes	India ...	Maraval ...	" 21.
31	John William ...	28	...	A	7	Yes	Trinidad ...	Port-of-Spain ..	Oct. 19.
32	Ida Thomas ...	9	...	T	1 month.	...	Trinidad ...	Port-of-Spain ..	" 16.
33	Louisa Lewis ...	31	...	A	19	Yes	Trinidad ...	Port-of-Spain ..	" 23.
34	Mahoree ...	45	...	A	1	...	India ...	Conupia ...	" 23.
35	Maria Ximenes ...	25	...	M	4	...	Trinidad ...	Arima ...	" 23.
36	Soya ...	35	...	M	8	Yes	Trinidad ...	Caroni ...	" 31.
37	Ismail ...	6	...	A	4	...	Trinidad ..	Caroni ...	" 31.
38	Robert Dixon ...	35	...	A	3	Yes	Trinidad ...	Port-of-Spain ..	Dec. 4.

* Not leprosy. Osteo-arthritis.

TABLE IV.

Birthplaces of Admitted.

BIRTHPLACE.					Male.	Female.	Total.
Trinidad ...	...	...	...	...	14	9	23
India ...	...	...	...	...	3	2	5
Barbados ...	...	...	...	...	3	3	6
St. Vincent	...	...	...	...	1	1	2
Dominica	...	...	...	...	0	1	1
Surinam ...	...	...	...	...	1	0	1
Total...					22	16	38

TABLE V.
Return of Discharges for 1889.

No.	Name.	Country.	Age.		Date of Admission.	Date of Discharge.	Total years of confinement.	Reason for Discharge.	Condition on Discharge.
			M.	F.					
1	Emily Oakes ...	Trinidad	...	56	Aug. 11, 1887...	Jan. 8, 1889 ...	32 A.	To stay with friends	... About the same as on admission. Eyes are a little more involved.
2	Sookharee ...	India	...	42	May 27, 1887...	Feb. 17, 1889...	9 A.	Left of own accord	... About the same as on admission. Has had a severe attack of eczema.
3	Janee ...	India	...	43	May 22, 1886...	March 1, 1889	3 A.	Left of own accord	... Noisy and demented. Has a chronic ulcer over the left knee, which she is constantly scratching.
4	Bundhoo ...	India	...	58	Aug. 19, 1886...	April 2, 1889...	8 A.	Left of own accord	... Sensation in right peroneal region has been improved by stretching right external popliteal. Muscles have increased in size, and ankle joint which was tail-like has become firmer so that he can walk.
5	John French ...	Barbados	...	43	Aug. 19, 1886...	April 5, 1889...	11 A.	Breach of rules	... Has lost a good deal of dead bone from fingers. Has symptoms of commencing phthisis.
6	Robert Dixon ...	Trinidad	...	36	July 12, 1889...	April 5, 1889...	3 A.	Own request	... Neuralgia has been relieved by stretching right supra-orbital. Stretching ulnar and median has had no effect on anaesthesia.
7	Louisa Lewis ...	Trinidad	...	31	March 9, 1888	July 8, 1889 ...	19 A.	Left of own accord	... Disease is stationary. Pregnant.
8	John William ...	Trinidad	...	29	Sept. 18, 1886...	July 8, 1889 ...	7 A.	Arrested by Police for wounding another patient with a razor	... Disease is stationary. Has chronic diarrhoea.
9	Thomasine Brusol	Trinidad	...	32	Sept. 19, 1888...	July 31, 1889...	4 T.	Threatening another patient	... Tubercles have increased since admission.
10	Florence Lewis...	St. Vincent	...	23	Sept. 19, 1888...	July 31, 1889...	10 T.	Threatening another patient	... Tubercles have increased. Frequent attacks of leprotic fever.

TABLE V.—CONTINUED.

Return of Discharges for 1889.

No.	Name.	Country.	Age.		Date of Admission.	Date of Discharge.	Total Years Afflicted.	Form of Leprosy.	Reason for Discharge.	Condition on Discharge.
			M.	F.						
11	Janeita Thompson	... Barbados	...	...	20 Jan. 17, 1887...	Aug. 10, 1889...	3	T.	Left of own accord	... Tubercles have increased. Pregnant.
12	Mungar	... India	52	...	Oct. 8, 1887	Sept. 4, 1889	5	A.	Left for India by return ship	Yaws gone. Ulcers of feet healed.
13	Seedial	... India	48	...	Aug. 19, 1886...	Sept. 4, 1889	6	M.	Left for India by return ship	No ulceration. Tubercles about the same as on admission. Pain and tension of shins relieved by stretching popliteals.
14	Florence Lewis...	... St. Vincent	...	...	23 Aug. 31, 1889...	Sept. 7, 1889	10	T.	Left of own accord	... Vide No. 10.
15	Marie Leger	... Dominica	...	...	78 Aug. 19, 1889...	Sept. 9, 1889	...	...	Found to have osteo-arthritis, not leprosy	...
16	Louisa Lewis	... Trinidad	...	...	31 Sept. 12, 1889	Sept. 17, 1889	19	A.	Transferred to Colonial Hospital	Vide No. 7.
17	Janeita Thompson	... Barbados	...	...	20 Aug. 31, 1889...	Sept. 15, 1889	3	T.	Transferred to Colonial Hospital	Vide No. 11.
18	Maria Ximenes...	... Trinidad	...	...	25 Oct. 23, 1889	Oct. 31, 1889	4	M.	Transferred to Colonial Hospital	Found to be pregnant.
19	Eugenie Lewis	... Trinidad	...	...	27 June 8, 1885	Dec. 14, 1889	6	T.	Left of own accord	... Tubercles have much increased. Frequent attacks of leprotic fever.
20	John William	... Trinidad	28	...	Oct. 10, 1889	Dec. 16, 1889	7	A.	Obscene language	... Vide No. 8.
21	Mahoree	... India	...	...	45 Oct. 26, 1889	Dec. 30, 1889	1	A.	To live with her two sons	Much relieved. Ulcer of foot healed.

TABLE VI.

Birthplaces of Discharged.

BIRTHPLACE.					Male.	Female.	Total.
Trinidad ...	...	...	...	...	3	6	9
India ...	...	...	...	...	4	2	6
Barbados...	...	...	...	...		2	3
St. Vincent	...	...	...	...	0	2	2
Dominica...	...	...	...	...	0	1	1
Total...					8	13	21

TABLE VII.

Return of Deaths for 1889.

No.	Name.	Country.	Age. M. F.	Date of Admission.	Date of Death.	Cause of Death.	Bacilli.	Post Mortem Appearances.
1*	Manuel Miller	Madaira ...	53	Nov. 10, 1888	Jan. 23, 1889	M Exhaustion from ulceration. Ankylos- tomiasis.	Numerous in spleen and testis. Few in liver, kidney, and larynx. None in femoral gland and median nerve.	Trunk and extremities covered with ulcers. Gangrene of fingers com- mencing. Tip of epiglottis ulcerated away. Ulceration of vocal cords and general thickening of mucous membrane. Small patch of concretion at base of right lung. A little fluid in pleura. Aorta atheromatous. Liver fatty. Spleen enlarged. Seven ankylostomata in small intestine. Femoral glands enlarged.
2*	Thomas Gift	Barbados ..	55	Jan. 22, 1889	Feb. 16, 1889	A Mixed kidney. Pleuritic effusion. Acute pericarditis.	None in kidney, liver, spleen, femoral gland, testis, median nerve.	Body wasted. Gdema of extremities. Commencing contraction of fingers. Median nerves somewhat thickened. Aorta two pints of fluid in left pleura; lung pressed against spine. Right pleura very adherent. Heart 15 oz.; much enlarged. Several ounces of fluid in pericardium; flakes of lymph on walls of heart. Spleen 9 oz.; simple hypertrophy. Cartilaginous nodule on surface. Kidneys 12 oz.; surfaces irregular; cortices thinned and blurred; numerous cysts varying in size from small shot to hens' eggs. Aorta and right renal artery atheromatous.
3*	Arthur Sheriff	Trinidad...	16	April 7, 1888	Feb. 19, 1889	T Sunstroke	None in pons, median nerve, liver, spleen, femoral gland, kidney.	Large masses of tubercle on face and chin; smaller on extremities. Median nerves much enlarged. Sinuses and vessels of brain en- gorged. Hypostatic congestion of lungs. Spleen 9 oz., becoming diffident. Malpighian bodies stand out like sago grains. Two splenuli. Blood fluid throughout body. Temperature in right pleural cavity 102.2°; in left 101.4°; in spleen 103.2°; in liver 106°. [Necropsy two hours after death.] Gall bladder full of bile. Bile in stomach and intestines. Slight redness in stomach. Femoral glands enlarged.
4*	Horree	India ...	51	Oct. 19, 1882	March 7, '89	A Exhaustion from ul- ceration and gan- grene.	None in kidney, spleen, liver, femoral gland, median nerve.	Body wasted. Gangrene of stump of right leg. Large ulcer over left outer malleolus. Symmetrical punched-out ulcers over buttocks. Median nerves thickened. Old deformity of fingers. Femoral glands enlarged. Pleurae adherent. Spleen adherent to diaphragm and sur- roundings. Kidneys 4 oz. Cortices filled with small cysts.

* Specimens shown at Annual Meeting of British Medical Association, Leeds, 1889.

† Lancet, April 20th, 1889, p. 781.

TABLE VII.—CONTINUED.

Return of Deaths for 1889.

No.	Name.	Country.	Colour.	Age.		Date of Admission.	Date of Death.	Form of Leprosy.	Cause of Death.	Bacilli.	Post Mortem Appearances.
				M.	F.						
5*	Sookur	India	C	39		April 30, '85	March 30, '89	T	Asphyxia from leprosy of larynx.	Few in liver and femoral gland. None in spleen, median nerve, kidney, larynx.	Large masses of tubercle on face, hands and feet; in some places becoming papillomatous. Epiglottis ulcerated; also vocal cords. Thickening and ulceration of mucous membrane of larynx; lumen blocked below cords. Spleen 10 oz. Femoral glands and median nerves enlarged.
6†	Poomassee	India	C	50		Dec. 21, 1885	April 1, 1889	T	Addison's Disease	Few in liver and femoral gland. None in adrenals, ganglia of aortic plexus, spleen, larynx, kidney, median nerve.	Body rather wasted. Nose sunken. Cornes opaque. Skin dark, rough. No extra pigment in axilla or groins. Fingers thickened; commencing ulceration at tips. Scars on prepuce, with contraction of orifice. Increase of pigment on inner surface and on glans. Line of pigment on inner surface of lips and along gums. But ulceration and gangrene beginning in month. Median nerves thickened. Tip of epiglottis ulcerated. Pigment in mucous membrane above epiglottis. But ulceration and gangrene beginning here also. Uvula nearly sloughed away, and fauces ulcerated. Mucous membrane of larynx thickened and ulcerated. Pleurae adherent in places. Several ounces of fluid in left pleura. Lungs rather cedematous at bases. Kidneys 8 oz.; some cysts. Old gumma on upper surface of liver, with some puckering. Adrenals lying in much fat. Converted into sacs containing brown debris, and lined with yellow grains looking like minute tubercles. No trace of medullary substance. Aortic ganglia enlarged; dark red. Brain 38 oz.; healthy. Much dark brown pigment in pia mater over medulla and upper part of cord. Femoral glands enlarged.
7*	Joahee	India	C	24		Jan. 14, 1885	April 20, '89	M	Exhaustion from long-continued suppuration. Ankylostomias. Mixed kidney. Hemorrhage after amputation.	Few in larynx, femoral gland, median nerve. None in liver, testis, suprarenal, kidney, spleen.	Body wasted, pale. Space between flaps of stump filled with dark blood clot. Median nerves somewhat thickened. Right sciatic (which was stretched) shows some yellow degenerated fibres. Ulcer on right sole healed. Fingers thickened, ulcerated. Mucous membrane of larynx thickened. Brown discoloration and slight ulceration over vocal cords. Few pleuritic adhesions on right side. Kidneys 9 oz.; cortices blurred; capsules adherent. Right adrenal 60 grains; left 105 grains. Structure normal. Numerous ankylostomata and hemorrhages in jejunum. Encysted hydrocoele of right testis. Hard fibrous tissue encroaching on tubules, which are interspersed with brown pigment. Femoral glands enlarged.

* Specimens shown at Annual Meeting of British Medical Association, Leeds, 1889.

† Lancet, Aug. 3rd, 1889, p. 214.

Return of Deaths for 1889.

No.	Name.	Country.	Colour.	Age.		Date of Admission.	Date of Death.	Form of Lesion.	Total Years Afflicted.	Cause of Death.	Bacilli.	Post Mortem Appearances.
				M.	F.							
8*	Magnus Alexander, Trinidad...		B	24		Feb. 18, 1877	April 28, '89	T	16	Tuberculosis, kidney.	Few in median nerve. None in adrenal, lung, liver, kidney, spleen, femoral gland.	Body very wasted. Suppurating cervical and femoral glands. Median nerves enlarged. Healed ulceration of fingers. Nails grooved and brittle. Mass of small tubercles at left apex, causing puckering and adhesion. Tubercles generally diffused through right lung. Spleen 8 oz. : several small tubercles on and near surface. Kidneys 7 oz. : capsules adherent : cortices blurred, and gelatinous looking. Some staining with iodine. One or two yellow tubercles.
9	Betsy Vestard ... Africa ...		B	60		July 30, 1884	June 22, '89	A	45	Cerebral hemorrhage		
10	Avriette Clarise ... Trinidad...		B	44		Sept. 6, 1888	Aug. 4, 1889	A	?	Phthisis. Tuberculosis	In median nerve numerous deeply stained cells with bacilli. No bacilli in lung, liver, spleen, kidney, ovarian cyst.	Body very wasted. Old spontaneous amputation of fingers. Pleura adherent. Cavity at right apex, with consolidation round. [Aspiration here had given relief during life.] Grey tubercles generally diffused through left lung. Spleen 12 oz. : simple hypertrophy : contains numerous small yellow tubercles. Several similar tubercles in liver. Suppurating ovarian cyst, about size of two fists.
11	Elvira Christopher, Trinidad...		B	16		April 29, '87	Sept. 7, 1889	T	4	Multiple ulceration : Cardiac hypertrophy and dilatation.	Numerous in femoral gland, liver, spleen, (some in cells.) Generally diffused in epiglottis. Few in kidney. None in heart, median nerve.	Serpiginous ulceration on legs, beginning to be gangrenous. Superficial ulceration of hands. Median nerves greatly thickened above wrists : fusiform : individual fibrils much enlarged. Superficial ulceration of epiglottis and vocal cords. Right pleura adherent. Heart 10 oz. : walls of left ventricle greatly hypertrophied. Cavities dilated. Spleen 10 oz. : simple hypertrophy. Kidneys 9 oz. : congested : numerous small ecchymoses in cortices and beneath muco-membrane of pelvis. Femoral glands much enlarged.
12	Jerome Flandinette, Trinidad...		B	15		May 18, 1889	Nov. 16, 1889	M	4	Large White Kidney	Few in median nerve. None in liver, kidney, spleen, testis, femoral gland.	Intense anemia. Edema of extremities. Most of tubercles absorbed. Scaly patches on lower extremities. Finger nails broken. Median nerves thickened. Two large patches of pleuro-pneumonia at left base. A good deal of effusion in both pleura. Upper part of right lung sodden and fleshy. Spleen 11 oz. : becoming diffident. Kidneys 14 oz. : large white : mottled on surfaces. A good deal of fluid in abdomen. Femoral glands slightly enlarged.

* Specimens shown at Annual Meeting of British Medical Association, Leeds, 1889.

TABLE VII.—CONTINUED.

Return of Deaths for 1889.

No.	Name.	Country.	Colour.	Age.		Date of Admission.	Date of Death.	Cause of Death.	Bacilli.	Post Mortem Appearances.
				M.	F.					
13	Sesunkoor	India	C	43		June 3, 1886	Nov. 18, 1889	M Granular kidney. Tuberculosis.	Few in liver, median nerve, lung, None in spleen, kidney, testis, femoral gland.	Body wasted. Skin rough and dry. Many tubercles absorbed. Fingers and toes ulcerated. Pleurae adherent in places. Patch of consolidation at left apex, with small cavities and a few tubercles. Spleen 8 oz. : firm : several small translucent tubercles. Kidneys 5 oz. : cortices thinned : capsules adherent in places. One small yellow tubercle in right cortex. Many ankylostomata in duodenum and jejunum : no hemorrhages seen. Femoral and mesenteric glands enlarged. Median nerves thickened, brown : individual fibres enlarged.
14	Madeline Joseph	Trinidad	B	70		Nov. 4, 1882	Dec. 13, 1889	A Cerebral thrombosis. Old age.	None in cortex, pons, median nerve, atheromatous cerebral artery.	Fingers contracted. Old amputation of toes. Median nerves thickened. Slight adhesions of pleurae. Kidneys 4 oz. : granular. Arteries of circle of Willis very atheromatous : thrombosis in some of them.
15*	Poomassecc	India	C	35		May 31, 1878	Dec. 20, 1889	A Mixed kidney. Dysentery.	None in spleen, liver, suprarenal, median nerve, femoral gland, kidney, ulcer of large intestine.	Body wasted. Median nerves atrophied. Stump of thigh firmly healed. A few pleuritic adhesions. Spleen 24 oz. : simple hypertrophy. Kidneys 7 oz. : left capsule very adherent : cortex thinned and blurred : right less affected. Large intestine intensely congested : small ulcers in places.
16	Doonee	India	C	29		Jan. 14, 1885	Dec. 25, 1889	T Large white kidney.	None in liver, kidney, tongue, larynx, femoral gland, median nerve.	Body wasted. Suppurating axillary, femoral and inguinal glands. Ulcerating tubercles on hands. Many tubercles absorbed. Median nerves thickened. Thickening and ulceration of mucous membrane over epiglottis, vocal cords and ventricles of Morgagni. General thickening of mucous membrane of larynx. Mouth much contracted from ulceration. Tongue thickened, scarred. A good deal of fluid in pleura and peritoneum. Spleen 6 oz. : a little thickening of capsule. Kidneys 10 oz. : large white.

TABLE VIII.

Birthplaces of Deceased.

BIRTHPLACE.					Male.	Female.	Total.
India ...	...	...	...	...	5	2	7
Trinidad...	...	...	...	...	3	3	6
Africa ...	...	...	...	...	0	1	1
Barbados	...	...	...	...	1	0	1
Madeira ...	...	...	...	...	1	0	1
Total ...					10	6	16

TABLE IX.

Deaths in each Month during past eight Years.

Month.	1882.			1883.			1884.			1885.			1886.			1887.			1888.			1889.			GRAND TOTAL.
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	
January ...	1	1	2	0	1	1	4	1	5	0	1	1	0	0	0	1	2	3	0	0	0	1	0	1	31
February ...	1	0	1	2	0	2	0	0	0	0	1	1	2	1	3	3	1	4	1	0	1	2	0	2	14
March ...	3	1	4	1	1	2	1	0	1	3	2	5	1	1	2	3	1	4	1	0	1	1	1	2	21
April ...	2	0	2	4	0	4	2	0	2	1	0	1	1	0	1	3	1	4	0	0	0	3	0	3	17
May ...	0	0	0	1	0	1	1	0	1	2	0	2	2	0	2	2	1	3	1	0	1	0	0	0	10
June ...	0	0	0	2	0	2	1	0	1	5	2	7	2	1	3	2	0	2	2	0	2	0	1	1	11
July ...	0	0	0	0	1	1	0	1	1	2	1	3	1	1	2	4	0	4	2	0	2	0	0	0	19
August ...	1	0	1	1	1	2	0	0	0	3	0	3	1	1	2	1	0	1	0	2	2	0	1	1	11
September ...	1	1	2	2	1	3	0	0	0	0	0	0	0	2	2	1	0	1	1	1	2	0	1	1	12
October ...	1	0	1	2	2	4	3	2	5	1	0	1	2	0	2	1	0	1	2	0	2	0	0	0	10
November ...	2	0	2	2	1	3	2	2	4	3	1	4	1	1	2	1	0	1	2	1	3	2	0	2	19
December ...	1	2	3	0	0	0	1	2	3	0	0	0	0	0	0	2	0	2	0	0	0	1	2	3	20
Total ...	13	5	18	17	8	25	15	8	23	20	8	28	13	8	21	24	6	30	12	4	16	10	6	16	177

TABLE X.

Chief Intercurrent Diseases during 1889.

DISEASE.	FORM OF LEPROSY.								GRAND TOTAL.	
	Tuberculated		Anæsthetic.		Mixed.		Total.			
	M.	F.	M.	F.	M.	F.	M.	F.		
I. General Diseases :										
Tuberculosis	...	1	...	...	...	1	...	2	...	2
II. Specific Febrile Diseases:										
Malarial Fever	...	16	18	59	7	23	7	98	32	130
Erysipelas	...	...	...	...	...	1	...	1	...	1
Syphilis	...	1	...	6	...	...	...	7	...	7
Measles	...	1	...	1	...	1	...	3	...	3
III. Diseases of the Nervous System :										
Epilepsy	...	...	...	1	1	...	...	2	...	2
Mania	...	...	...	...	...	...	1	...	1	1
Sunstroke	...	1	...	...	...	...	...	1	...	1
Cerebral Hæmorrhage	...	...	...	...	1	...	...	...	1	1
Thrombosis	...	...	...	...	1	...	...	...	1	1
IV. Diseases of the Eye :										
Ophthalmia	...	1	...	3	...	1	...	5	...	5
Corneal Ulcer	...	...	...	3	...	...	...	3	...	3
Cataract	...	...	...	...	...	1	...	1	...	1
Iritis	...	...	...	...	...	...	1	...	1	1
Trichiasis	...	...	...	1	...	...	...	1	...	1
Pterygium	...	...	...	1	...	...	...	1	...	1
V. Diseases of the Circulatory System :										
Pericarditis	...	...	...	1	...	...	...	1	...	1
Cardiac Hypertrophy and Dilatation	...	...	1	...	...	...	...	...	1	1
VI. Diseases of the Respiratory System :										
Pleurisy	...	...	...	1	...	...	...	1	...	1
Bronchitis	...	...	...	7	...	4	...	11	...	11
Phthisis	...	2	...	5	1	...	...	7	1	8
VII. Diseases of the Digestive System :										
Diarrhoea	...	1	3	15	...	6	1	22	4	26
Dysentery	...	3	1	8	1	1	...	12	2	14
Hæmorrhoids	...	...	...	1	...	...	...	1	...	1
Hernia	...	...	...	1	...	...	...	1	...	1
Carried forward	...	27	23	114	12	39	10	181	44	225

TABLE X.—CONTINUED.

Chief Intercurrent Diseases during 1889.

DISEASE.	FORM OF LEPROSY.								GRAND TOTAL.
	Tuberculated		Anæsthetic.		Mixed.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	
Brought forward ...	27	23	114	12	39	10	181	44	225
Diseases of the Liver :									
Syphilis ...	1	...	...	...	...	...	1	...	1
Tubercle ...	...	...	...	1	...	...	...	1	1
Parasites :									
Ankylostoma duodenale ...	...	...	...	..	3	...	3	...	3
Ascaris lumbricoides ...	...	...	...	...	1	...	1	...	1
VIII. Diseases of the Spleen:									
Hypertrophy ...	...	2	1	1	1	...	2	3	5
Tubercle ...	1	...	...	1	...	...	1	1	2
IX. Diseases of the Adrenals:									
Addison's Disease ...	1	...	...	...	...	...	1	...	1
X. Diseases of the Urinary System :									
Large White Kidney ...	...	...	1	...	...	...	1	...	1
Granular Kidney ...	...	...	...	...	1	...	1	...	1
Mixed Kidney ...	...	...	2	...	...	...	2	...	2
Tubercle of Kidney ...	1	...	...	...	...	...	1	...	1
XI. Diseases of the Generative System :									
Ovarian Cyst ...	...	...	...	1	...	...	...	1	1
XII. Diseases of the Skin :									
Eczema ...	...	...	6	...	1	...	7	...	7
Framboesia ...	...	1	2	1	...	...	2	2	4
Psoriasis ...	...	...	1	...	...	...	1	...	1
Scabies ...	1	...	...	...	...	...	1	...	1
Zona ...	...	...	1	...	...	...	1	...	1
Tinea ...	...	...	2	...	...	...	2	...	2
Total ...	32	26	130	17	46	10	209	52	261

During the year there have been eleven cases of leprotic fever, i.e. fever accompanied by an outbreak of tubercles.

TABLE XI.

Surgical Operations during 1889.

OPERATION.	FORM OF LEPROSY.								GRAND TOTAL.		
	Tubercu- lated.		Anæsthetic.		Mixed.		Total.				
	M.	F.	M.	F.	M.	F.	M.	F.			
Amputation :											
Through Leg	...	...	...	...	1	...	1	...	1		
Ankle	...	...	...	1	...	...	1	...	1		
Of Great Toe	...	...	...	5	...	...	5	...	5		
Toe	...	...	...	6	...	...	6	...	6		
Finger	...	...	...	8	...	6	14	...	14		
Stretching of :											
Sciatic	...	...	...	2	...	...	2	...	2		
External Popliteal	...	...	...	1	...	...	1	...	1		
Removal of :											
Necrosed bone or Cartilage..	...	1	139	5	23	...	162	6	168		
Tubercles	...	...	...	...	1	...	1	...	1		
Exuberant Granulations	...	1	...	3	...	2	...	6	6		
Eyeball	...	...	...	1	...	...	1	...	1		
Ligature of :											
Vessels supplying Tubercle of Conjunctiva	...	1	...	...	...	...	1	...	1		
Incision of :											
Abscess, Sinus, Ulcer* or to relieve tension	...	2	...	153	7	30	...	185	7	192	
Circumcision	...	...	1	...	...	...	...	1	...	1	
Tattooing Eye	...	...	...	...	...	1	...	1	...	1	
TOTAL	...	...	5	1	319	12	58	...	388	13	401

* This includes perforating ulcers, the treatment of which is referred to on another page.

TABLE XII.

Further cultivation experiments with leprous material and suspected substances.

No.	Date.	Nutrient Medium.	Material used.	Result.	Microscopic Appearances.	Remarks.
1	1889. Feb. 15	Agar and serum	Vaccine lymph from Avriette Clarisse. (Age 44 : Anæsthetic.)	July 19. Yellowish white oily growth along track of wire, and on surface of serum.	Swarms of micrococci. N.	Left five months undisturbed.
2	"	"	"	No growth along track of wire but patches of oily growth on surface.	Few micrococci. N.	"
3	Feb. 17	"	Thickened nerve from Thomas Gift. (Age 55 : Anæsthetic.)	July 19. Powdery white mould over dried up fragment. Pale yellow oily growth over rest of surface.	Quantities of micrococci. N.	"
4	Feb. 19	"	Tubercle of chin from Arthur Sheriff. (Age 16 : Tub.)	July 19. Patches like drops of yellow oil paint. Dark pigment diffused in serum around fragment of tubercle.	Swarms of micrococci. N. $\frac{1}{3}$ oil immersion showed some of spores rather long and a few rods, but no leprosy bacilli.	Material taken six hours after death. Left five months undisturbed in tube.
5	"	"	"	Similar yellow growth, also salmon coloured growth. Pale canary yellow growth round edge of serum.	Similar appearances.	"
6	"	"	Piece of spleen from Arthur Sheriff.	Similar dirty yellow growth	Similar appearances.	"
7	"	"	Piece of cerebral hemisphere from Arthur Sheriff.	No apparent growth. No liquefaction of serum	Few micrococci. Do not take magenta readily. N.	"
8	"	"	"	"	Similar appearance.	"
9	"	"	Piece of kidney from Arthur Sheriff.	Dirty yellow oily growth. Very thick over fragment of kidney.	Quantities of micrococci. N.	"
10	"	"	"	Similar growth scattered over surface of serum	Ditto.	"
11	"	"	Piece of liver from Arthur Sheriff.	Similar growth on surface of serum round fragment	Swarms of micrococci. N.	"
12	"	"	"	Similar growth, also white patch like mould	Ditto.	"
13	"	"	Piece of median nerve from Arthur Sheriff.	Dirty yellow oily growth, mixed with bright yellow growth near fragment of nerve. Patch of white growth like mould on surface of serum.	Ditto.	"

N. All colour destroyed by nitric acid.

TABLE XII.—CONTINUED.
Further cultivation experiments with leprous material and suspected substances.

No.	Date.	Nutrient Medium.	Material used.	Result.	Microscopic Appearances.	Remarks.
14	1889. Feb. 19	Agar and serum	Piece of median nerve from Arthur Sherifi.	Similar growth on surface of serum. Also a good deal of white powdery growth like mould round fragment.	Swarms of micrococci. N.	Material taken 6 hours after death. Left five months undisturbed in tube.
15	"	"	Piece of femoral gland from Arthur Sherifi.	Small dark yellow patch round fragment. Pale growth lower down on surface.	Quantities of micrococci. N.	"
16	"	"	"	Dark yellow patch near original fragment. Pale generally diffused growth over rest of surface.	Ditto.	"
17	"	"	[Control tube. Not inoculated]	July 19. No liquefaction. Doubtful growth. Dirty pinkish white.	Micrococci. N.	Left five months undisturbed.
18	July 20	Gelatine, agar, and hydrocele fluid.	Growth from tube 1	Aug. 8. Commencing liquefaction. Small whitish growth.	...	...
19	"	"	Growth from tube 2	Commencing liquefaction. Yellow growth	...	...
20	"	"	Part of tube 17	Liquefaction. Floating olive green mass, and thin whitish scum.	...	...
21	July 21	"	Growth from tube 13	Dark olive green colour and dirty white growth	Numerous spores and large rods. N.	...
22	"	"	Growth from tube 14	Yellowish white growth and some spots of white	Ditto.	...
23	"	"	Growth from tube 11	Dark brown discoloration of serum. Dirty white growth. No liquefaction.	Ditto.	...
24	"	"	Growth from tube 12	Dirty white growth. No liquefaction.	Ditto.	...
25	July 23	"	Growth from tube 4	Yellowish white growth. No liquefaction.	Ditto.	...
26	"	"	Growth from tube 5	Similar growth.	...	...
27	"	"	Growth from tube 6	Dirty white growth. Yellowish discoloration. No liquefaction.	Few micrococci. Numerous large rods. N.	...

N. All colour destroyed by nitric acid.

TABLE XII.—CONTINUED.

Further cultivation experiments with leprous material and suspected substances.

No.	Date.	Nutrient Medium.	Material used.	Result.	Microscopic Appearances.	Remarks.
28	1889, July 25	Gelatin, agar, and hydro- cele fluid.	Growth from tube 9	...	Yellow growth. Brown discoloration of serum. Mold.	Numerous spores and rods. N.
29	"	Half Potato	Growth from tube 15	...	Thick white growth of mould; also yellow growth, which staining shows to extend about $\frac{1}{4}$ in. into potato substance.	Few spores. Much mycelium.
30	"	"	Growth from tube 16	...	Similar growth.	Ditto.
31	"	"	Growth from tube 7	...	Yellow growth more marked.	Ditto.
32	"	"	Growth from tube 8	...	Ditto.	Ditto.
33	July 30	Serum and agar	Growth from tube 3	...	Yellow growth and mould.	
34	Aug. 30	Solidified Hydrocele fluid.	Growth from tube 25	...	Sept. 3. Commencing liquefaction. Liquid turbid.	
35	"	"	Growth from tube 26	...	Ditto.	
36	"	"	Growth from tube 21	...	Ditto.	
37	"	"	Growth from tube 22	...	Ditto.	
38	"	"	Growth from tube 27	...	Ditto.	
39	"	"	Growth from tube 23	...	Ditto.	
40	"	"	Growth from tube 24	...	No change.	
41	"	"	Growth from tube 9	...	"	
42	"	"	Growth from tube 10	...	Commencing liquefaction. Liquid turbid.	
43	"	"	Growth from tube 4	...	"	

N. All colour destroyed by nitric acid.

TABLE XII.—CONTINUED.
Further cultivation experiments with leprous material and suspected substances.

No.	Date.	Nutrient Medium.	Material used.	Result.	Microscopic Appearances.	Remarks.
44	1889. Aug. 30	Solidified hydrocele fluid.	Growth from tube 5	... Distinct dirty white oily growth in line of wire. No liquefaction.	...	
45	"	"	Growth from tube 18	... Commencing liquefaction. Liquid turbid.	...	
46	"	"	Growth from tube 30	... Ditto.	...	
47	"	"	Growth from tube 20	... Ditto.	...	
48	Sept. 3	"	Earth from grave of Thomas Gift...	Dirty white growth. Some putrid smell.	... Numerous spores. Few short rods. N.	
49	"	"	" Elvira Adanson	Similar growth. Also common mould.	... Numerous spores. Many rods of various lengths.	
50	"	"	" Poonassee	Ditto.	Ditto.	
51	"	"	" Manuel Miller..	Similar growth. No mould. No liquefaction.	Ditto.	
52	"	"	" Charles Samuel.	Liquefaction. White growth. Very putrid.	Ditto.	
53	"	"	" Betsy Vestard..	Dirty white growth. Slight liquefaction.	Ditto.	
54	"	"	" Dixon Job	Similar mould. Some mould. No liquefaction.	Ditto.	
55	"	"	" Arthur Sheriff...	Ditto.	Ditto.	
56	"	"	Earth from garden at Maraval	Some white growth. Much liquefaction. Very putrid...	Very few rods and spores.	
57	Sept. 6	"	Piece of liver from Elvira Christopher. (Age 17; Tub.)	Sept. 19. Thick yellowish white growth like oil paint...	Numerous micrococci. N.	Taken thirteen hours after death.
58	"	"	Piece of spleen from Elvira Christopher.	White growth like mould.	... Few larger micrococci. N.	"
59	"	"	Piece of kidney from Elvira Christopher.	Similar growth Commencing liquefaction.	... Numerous micrococci. Also many short thick rods. N.	"

N. All colour destroyed by nitric acid.

TABLE XII.—CONTINUED.

Further cultivation experiments with leprosy material and suspected substances.

No.	Date.	Nutrient Medium.	Material used.	Result.	Microscopic Appearances.	Remarks.
60	1889. Sept. 6	Solidified hydrocele fluid.	Piece of heart from Elvira Christopher.	Yellow oily growth. Also patches of growth near fragment.	Swarms of micrococci.	... Taken thirteen hours after death.
61	"	"	Piece of epiglottis from Elvira Christopher.	Similar whitish oily growth.	Ditto.	...
62	"	"	Piece of femoral gland from Elvira Christopher.	Similar growth. Also mould.	Ditto.	...
63	"	"	Piece of median nerve from Elvira Christopher.	Yellowish oily growth.	Ditto.	...
64	Nov. 8	Hydrocele fluid and agar.	Fragment of salt fish	Nov. 16. Dirty yellow growth.	Débris and some spores. No leprosy bacilli.	...
65	"	"	Fragment of salt pork	Ditto.	Ditto.	...
66	"	"	Decayed pigeon pea	Ditto.	Ditto.	...
67	Dec. 20	Solidified hydrocele fluid.	Piece of ulcerated large intestine from Poomassee. [Age 35. Auscultatory]	Dirty yellow growth like oil paint. Translucency of opaque serum.	Numerous spores. N.	...
68	"	"	"	Ditto.	Ditto.	...
69	1890. Jan. 5	"	Growth from tube 67	Jan. 29. Liquefaction and dirty white growth. Putridity.	Ditto.	...
70	"	"	Growth from tube 68	Ditto.	Ditto.	...

N. All colour destroyed by nitric acid.

TABLE XIII.
Further Inoculations of Animals with Leprous Tubercles and Cultures.

Number.	Animal Inoculated.	Site of Inoculation.	Source of Material.	Form of Leprosy.	Date of Inoculation.	Date of last Examination.	Result.	Remarks.
1	Oat	Neck	Vaccine lymph from Cheenaghan	A.	Sept. 20, 1884...	Feb. 9, 1889 ...	On being killed, no evidence of leprosy was found. Ranula under tongue. Viscera healthy. Magenta showed no bacilli in liver, spleen, tissues of back near site of inoculation, or fluid from ranula	Inoculated four and a half years ago.
2	Guinea Pig	On back. In three places	Culture from tubercle of chin of Arthur Sherill. Tube 2	T.	July 25, 1889...	Jan. 30, 1890...	Hair grown. No evidence of inoculation	July 28. Scabs at site of inoculation examined microscopically. Magenta shows a few micrococci; no bacilli. All colour destroyed by nitric acid.
3	"	On back. In two places	Ditto. Tube 1	"	"	"	"	Ditto.
4	Rabbit	Each side of back	Pieces of tubercle from Robin Gobonia: each piece about $\frac{1}{4} \times \frac{1}{4} \times \frac{1}{8}$...	"	Aug. 2, 1889 ...	"	Scar at site of inoculation and slight thickening. No other evidence	On Nov. 23, 1889, there was a swelling the size of a damson. This appears to have been an abscess which afterwards burst.
5	"	Back of neck	Piece of tubercle from Robin Gobonia about $\frac{1}{2} \times \frac{1}{4} \times \frac{1}{8}$	"	"	Aug. 16, 1889...	Died. Viscera healthy. Tubercle found lying beneath skin, encapsuled in a false membrane of lymph. Tubercle adherent to muscles, beneath. Incision firmly healed. No redness round. Magenta showed no bacilli in capsule of tubercle, skin near tubercle, lung, liver, kidney, spleen	This resembles results previously obtained in fowls [vide <i>British Medical Journal</i> , Feb. 5, 1887, p. 275.]

Further Inoculations of Animals with Leprous Tubercles and Cultures.

Number	Animal Inoculated.	Site of Inoculation.	Source of Material.	Form of Leprosy.	Date of Inoculation.	Date of last Examination.	Result.	Remarks.
6	Cat	... Back of neck	... Scraping from ulcers of Robin Gobonia	T.	April 13, 1884...	Sept. 6, 1889 ...	No evidence of leprosy	... Inoculated five and a half years ago.
7	Guinea Pig...	Back	... Solution of culture of femoral gland from Elvira Christopher	"	Nov. 6, 1889	Nov. 7, 1889 ...	Died. No evidence at site of inoculation. Viscera appear healthy. Magenta showed no bacilli in juice from beneath skin at site of inoculation, lung, liver, heart, spleen, kidney.	
8	"	"	"	"	"	Jan. 30, 1890 ...	Hair grown. No evidence of inoculation.	
9	"	"	"	"	"	"	"	"
10	"	"	"	"	"	"	"	"
11	"	"	"	"	"	"	"	"
12	Hog	... Back of neck	... Piece of tubercle from Robin Gobonia about $\frac{1}{4} \times \frac{1}{4} \times \frac{1}{2}$	"	Nov. 22, 1889...	Jan. 13, 1890 ...	Has grown much. Very fat. Scars have almost disappeared. No lump to be felt.	
13	Sow	"	... Piece of tubercle about $\frac{1}{2} \times \frac{1}{4} \times \frac{1}{8}$ from face of Furnah (he has fever every afternoon.)	"	"	"	Ditto.	

TABLE XIV.
Experiments on protective and antagonistic Inoculation in Lepers.

No.	Name.	Age.		Form of Leprosy.	Years Afflicted.	Culture used.	Date of Inoculation.	Date of Last Examination.	Result.	Remarks.
		M.	F.							
1	Poomasue	...	35	A	13	Secondary growth from tubercle of chin of Arthur Sheriff.	Aug. 16, 1889	Dec. 20, 1889	Died of mixed kidney and dysentery. No evidence of inoculation found. Magenta showed no bacilli in spleen, liver, adrenal, median nerve, femoral gland, kidney, large intestine.	Temporary redness and swelling.
2	Walter Wears	...	17	A	9	Growth from liver of Elvira Christophers.	Oct. 16, 1889	Jan. 27, 1890	None. Has phthisis	Temporary redness at site of inoculation.
3	Joseph De Freitas	...	52	A	3	Secondary growth from tubercle of chin of Arthur Sheriff.	Aug. 21, 1889	"	None.	Pain for three days.
4	Robin Gobonia	...	20	T	11	Secondary growth from tubercle of chin of Arthur Sheriff and growth from liver of Arthur Sheriff.	July 31, 1889	"	No evidence of inoculation in tubercles. They are shrinking, but all tubercles are shrinking now from progress of disease.	Temporary redness and ulceration of tubercles for a few days after inoculation.
5	"	...	"	"	"	Secondary growth from tubercle of chin of Arthur Sheriff.	Aug. 21, 1889	"	Do.	Shortly after inoculation had a shivering fit, T. 99-8°. Had fever and superficial ulceration for a few days.
6	Fallee	...	38	A	3	Growth from tubercle of chin of Arthur Sheriff.	July 26, 1889	"	Slight cicatrix, No thickening.	Temporary oedema and redness round for several inches.
7	Khadoo	...	48	A	10	Growth from tubercle of chin of Arthur Sheriff.	Aug. 21, 1889	"	None.	Thick grumous discharge and thickening around inoculation up to Sept. 9.

Experiments on protective and antagonistic inoculation in Lepers.

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No.	Name.	Age.		Form of Leprosy.	A. Afflicted. Years.	Culture used.	Date of Inoculation.	Date of Last Examination.	Result.	Remarks.
		M.	F.							
8	Gopee	...	36	A	19	Growth from tubercle of chin of Arthur Sheriff introduced below right elbow. Secondary growth from tubercle of chin of Arthur Sheriff introduced below left elbow.	July 26, 1889	Jan. 27, 1890	Cicatrices below both elbows, No thickening. Skin still eczematous.	Redness and oedema for several days, followed by local eczema. No general disturbance.
9	Kalassar	...	35	A	5	Growth from liver of Elvira Christopher.	Oct. 16, 1889	"	None.	Small tender nodule size of pea, two days after inoculation.
10	Madoosingh	...	42	A	5	Do.	"	"	None.	Temporary swelling at site of inoculation.
11	James Alfred	...	80	A	6	Secondary growth from tubercle of chin of Arthur Sheriff.	Sept. 16, 1889	"	None.	Fever and some pain after inoculation.
12	Juman	...	43	A	4	Growth from liver of Elvira Christopher.	Oct. 16, 1889	"	None.	Redness, hardness, and tenderness for a few days over area of 1 in. diam.
13	Aladdin	...	42	A	5	Do.	"	"	None.	Abscess about 1 in. diam. formed at site of injection. Microscopic examination of pus showed micrococci, N.
14	John Pascal	...	19	M	3	Secondary growth from tubercle of chin of Arthur Sheriff.	Sept. 16, 1889	"	No evidence of inoculation. Has now acute outbreak of tubercles on face and arms.	Inoculation performed during fever, to see if receptivity greater. Fever went in two days, but pain and swelling lasted a little longer.

N. All colour destroyed by nitric acid.

TABLE XIV.—CONTINUED.

Experiments on protective and antagonistic inoculation in Lepers.

No.	Name.	Age.		Form of Leprosy.	Years Afflicted.	Culture used.	Date of Inoculation.	Date of last Examination.	Result.	Remarks.
		M.	F.							
15	Henry Matthews	...	14	M	5	Secondary growth from tubercle of chin of Arthur Sheriff	Aug. 19, 1889	Jan. 27, 1890	No evidence in right ear, or in two little fingers. Ulcer on back of right forearm.	There was superficial ulceration in left little finger and right lobe of ear nine days after inoculation: also considerable destruction of tissue on back of right forearm.
16	George Stewart	...	15	T	5	Do.	Sept. 16, 1889	"	None.	Temporary pain and swelling. Inoculation performed during fever to see if receptivity greater.
17	William Toussaint	...	20	T	3	Do.	"	"	None.	Also inoculated during fever. Temporary pain: no swelling.
18	Rafus Tait	...	6	M	1m.	Do.	July 31, 1889	"	Scars visible at left elbow but tubercles gone.	Incisions healed in five days.
19	"	...	"	"	"	Do.	Aug. 19, 1889	"	Copper coloured patches near elbows remain but tubercles gone.	Temporary fever, swelling and redness. Temp. 101.2°. Superficial ulceration. Tubercles had rapidly disappeared in this patient before inoculation.
20	Elias Donatien	...	13	A	6	Growth from liver of Elvira Christophet.	Oct. 16, 1889	"	Slight sensation in inoculated patch. Says he feels more than he used to. No evidence of inoculation.	Anasthetic patch inoculated. Temporary thickening and tenderness.

Experiments on protective and antagonistic inoculation in Lepers.

No.	Name.	Age.		Form of Leprosy.	Years Afflicted.	Culture used.	Date of Inoculation.	Date of last Examination.	Result.	Remarks.
		M.	F.							
21	John Rodriguez	...	16	M	5	Secondary growth from median nerve of Thomas Gift.	Aug. 19, 1889	Jan. 27, 1890	Tubercle of elbow scabbed over; not smaller. Scar of incision below left eye, but tubercle same size. Lobes of ears in same state.	Immediately after inoculation had fever (T 102°), followed by ulceration of all inoculated tubercles, Sept. 4. Effusion in joints of some fingers of both hands and abscess into side of left hand. Glairy fluid escaped on incising, and showed under microscope a few micrococci and numerous small rods entangled in débris. Stain deeply with magenta. N.
22	Ernest Berrington	...	8	M	2	Secondary growth from tubercle of chin of Arthur Sheriff.	Aug. 16, 1889	"	No evidence below right eye. Ulcerating tubercles below left eye. Increasing tubercle with scab on it, above right elbow.	U.—Inoculation performed during fever to see if receptivity greater then. Ulceration set up in tubercle below left eye and over right elbow.
23	"	...	8	"	2	Growth from liver of Elvira Christopher.	Oct. 16, 1889	"	Mass of tubercles on left cheek ulcerating.	Suppuration set up in mass of tubercles after inoculation. Microscope shows numerous micrococci, losing stain with nitric acid, and rods retaining stain (probably bacilli from mass of tubercle).

N. All colour destroyed by nitric acid

TABLE XV.
Observations on Earth taken from Surface of Graves in Leper Asylum Cemetery.

No.	Name.	Age.		Date of Interment.	Date of Examination.	Result of Microscopic Examination.	Remarks.
		M.	F.				
1	Thomas Gift	...	...	A. Jan. 17, 1889	...	Numerous rods	...
2	"	...	...	"	...	"	Earth retains magenta.
3	Elvira Adamson	...	25	A. Nov. 25, 1888	Aug. 12, 1889	...	Earth deeply stained.
4	"	...	"	"	...	"	Some darkly stained round masses.
5	Poomassee	...	...	T. April 2, 1889	Aug. 12, 1889	...	Earth deeply stained.
6	"	...	...	"	...	"	"
7	Manuel Miller	...	54	M. Jan. 23, 1889	Aug. 12, 1889	...	"
8	"	...	"	"	...	"	"
9	Charles Samuel	...	48	A. Feb. 1, 1887	Aug. 12, 1889	Few rods	"
10	"	...	...	"	...	"	"
11	Betsy Vestard	...	60	A. June 23, 1889	Aug. 12, 1889	No rods	No necropsy in this case.
12	"	...	"	"	...	"	"
13	Dixon Job	...	44	Feb. 28, 1887,	Aug. 12, 1889	Few rods	This was a case of phthisis, not leprosy.
14	"	...	"	"	...	Numerous rods	"
15	Arthur Sheriff	...	16	T. Feb. 19, 1889	Aug. 12, 1889	"	"
16	"	...	"	"	...	"	"
17	Earth from garden at Maraval...	...	...	...	Aug. 12, 1889	Several similar stained rods	Control experiment.
18	"	...	...	...	"	"	"

TABLE XVI.
Examination of Food.

No.	Kind of Food.	Date of Examination.	Number of Slides.	Result.
1	Salt Pork ...	Nov. 8, 1889 ...	4	Large bacilli of various sizes. No leprosy bacilli.
2	Fat of Salt Pork ...	" ...	2	In one a few large bacilli; not leprosy. In the other no bacilli.
3	Pigeon Peas ...	" ...	4	Starch cells. Few large bacilli. No leprosy bacilli.
4	Decaying and mouldy pigeon peas	" ...	2	Large spores. Few long rods. No leprosy bacilli.
5	Decaying Salt Fish ..	" ...	4	No bacilli.
6	" "	" ...	2	Few spores and some rods. No leprosy bacilli.

TABLE XVII.
Return of Lepers in Trinidad, 1889.

No.	Locality.					Male.	Female.	Total.
1	Leper Asylum...	...	...	...	...	166	44	210
2	Diego Martin ...	...	...	...	...	13	18	31
3	Port-of-Spain ...	...	...	...	...	13	8	21
4	Laventille ...	...	...	...	...	11	3	14
5	San Fernando ...	...	...	...	...	5	7	12
6	Tacarigua ...	...	...	...	...	9	3	12
7	Naparima ...	...	...	...	...	8	2	10
8	Indian Walk ...	...	...	...	...	3	4	7
9	Arima ...	...	...	...	...	5	2	7
10	Savana Grande	...	...	...	...	1	4	5
11	Chaguanas ...	...	...	...	...	4	1	5
12	Couva ...	...	...	...	...	5	0	5
13	Cedros ...	...	...	...	...	2	2	4
14	Oropouche ...	...	...	...	...	1	0	1
15	Guaracara ...	...	...	...	...	1	0	1
16	Mayaro ...	...	...	...	...	1	0	1
17	Gran Couva ...	...	...	...	...	1	0	1
18	Erin ...	...	...	...	...	1	0	1
19	St. Joseph ...	...	...	...	...	0	0	0
20	Pointe-à-Pierre	...	...	...	...	0	0	0
21	Toco ...	...	...	...	...	0	0	0
Total						250	98	348

TABLE XVIII.
Results of Chaummoogra Treatment.

No.	Name.	Age. M. F.	Form of Leprosy.	Years Afflicted.	Date of beginning oil.	Dose.	Whether used exter- nally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statement.
1	John Harewood	43	A	3	Sept. 1, 1889	—	Externally only Pure	Oct. 18, 1889	Anæsthetic taches on right cheek, left shoulder, back of left hand, right leg, and left ankle.	Tache on right cheek. Anæsthesia over right toes, and part of metatarsals. Sensation normal in left foot. Backs of hands anæsthetic but not palms. Pale tache on left dorsum.	Oil has carried away some stain from hands since he used it.
2	Henry Clark	34	T	4	Feb 15, 1889, (omitted it for 2 months)	m. xv. t.d.	Yes Pure	Oct. 18, 1889	Tuberculation of face and ears. Skin of extremities dry and scaly, not anæsthetic. Fingers swollen and tapering. Toe-nails broken.	Tubercles gone from ears and almost from face. Fingers becoming contracted. Right little finger anæsthetic. Forearms and legs still scaly. Sinus in right foot.	Has less pain. Sensation has very much increased in right hand. Oil used to make him vomit, but he now tolerates it.
3	Charles Hall	42	M	1	Feb. 11, 1889	m. x. t.d. gradually in- creased to m. xxx. t.d.	Yes with lime water	Oct. 30, 1889	Small copper coloured nodules above eyebrows. Small discolorations at sides of nose, and one large one at end with some thickening. Nodule on each cheek about $\frac{1}{2}$ in. diameter by $\frac{1}{4}$ in. deep. Large tubercles in lobes of ears, and tubercle at tip of each helix. Sensation rather lessened on back of right forearm. Fingers thickened generally with here and there tubercles. Some numbness at tips of third and fourth fingers of left hand, also in all fingers of right hand. Right little finger contracted. Some numbness on dorsa of hands. Slight anæsthesia dorsum of left foot.	One tubercle on each cheek and some thickening of lobes of ears, but all these tubercles are loose and flabby. Brown discoloration on right temple. Tubercle at tip of helix on each side is smaller. Left hand : sensation down to tips of fingers. Some thickening of fingers still, but no discrete tubercles. Right hand : contraction of little finger. Thickening of other fingers. Some numbness on dorsum but sensation at tips of fingers. Two tubercles on dorsum of fourth finger. Feet and legs normal : no anæsthesia now.	Since increasing oil sensation has returned to left hand, and stiffness has gone, so that he can move fingers readily. Tubercles on face have much lessened since admission, (but they were going before he came in. He used to drink tar-water). Does not perspire so much as formerly.

Results of Chaulmoogra Treatment.

No.	Name.	Age.		Form of Leprosy.	Years Afflicted.	Date of beginning oil.	Dose.	Whether need externally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statement.
		M.	F.									
4	Julian Brown	22		M	8	Apr. 18, 1889	m. x. t. d.	Yes	Oct. 18, 1889	Thickening and tuberculation of face and ears: latter ulcerated. Trunk covered with small tubercles discrete and in clusters. Small tubercles on arms and forearms, especially on extensor surfaces. Anesthesia from elbow downwards. Third, fourth and fifth left fingers incurved and torted. Superficial ulceration of fingers. Anesthesia both thighs and left foot. Skin of legs thickened. Small ulcers lower third of right leg.	Much thickening and tuberculation of nose, cheeks, ears, lips and face generally. Ears ulcerated. Hands and fingers swollen, ulcerated: also feet and toes. Fingers of left hand anesthetic. Sensation in feet. Tubercles on back and front of trunk about the size of small shot. Disease has advanced considerably.	Since using oil he has noticed tubercles on face and trunk getting smaller. Sensation has returned a little in right hand.
5	Peter Taylor	61		M	8	Sep. 25, 1889	m. xx. b. d.	No	Oct. 25, 1889	Dark patches and small nodules on forehead and cheeks. Orifices of sweat glands on nose enlarged and plugged with black material. Left ear slightly tuberculated. Pale slightly raised shining patches on trunk and upper extremities with hypertrophied sweat ducts. Fingers slightly shrivelled but not deformed: sensation good. Left thenar eminence more wasted than right. Skin of lower extremities rough and creased. Sweat glands hypertrophied. Dark patches on all extremities	Few tubercles on face. Third, fourth, and fifth fingers of left hand ankylosed and joints bent backwards. Sensation absent in fourth finger: diminished in others. Fourth and fifth nails beginning to be affected. Sensation impaired in left lower extremity. Scaly eruption on legs. Disease has advanced.	He feels stronger when he takes the oil. It purges him. He does not notice any difference in the skin. He has been using the oil off and on for the last two years, sometimes dropping it for three months. At first took m. x. t. d.: now takes m. xx. b. d.

TABLE XVIII.—CONTINUED.

Results of Chaulmoogra Treatment.

No.	Name.	Age. M. F.	Form of Leprosy.	Years Afflicted.	Date of beginning oil.	Dose.	Whether used externally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statement.
6	John Claremont	34	A	6	July 15, 1888. [Left off taking oil on Nov 1 1888.]	m. xv. t. d.	Yes	Oct. 25, 1889	Few pale patches on neck and trunk: no anesthesia. Sensation down to middle of forearms. Skin rough, thickened, and inclined to be pustular over elbows. Fingers contracted; nails more or less destroyed. Ends of forefingers gone. Thumbs shortened by absorption of phalanges. Fingers quite anesthetic. Sensation in lower extremities to just above ankles. Right foot: perforating ulcers at heel and toes. Left foot: perforating ulcer near toes. Some toes gone from feet. Anesthesia in left sole. Nails normal.	Large pale patches over back: anesthetic over scapula. Hands anesthetic. Ulcer on right sole about three inches long. Small ulcer on left sole at base of toes. Sensation in both lower extremities down to ankles. Left sole anesthetic.	After taking oil he felt quite well and strong and very hungry. He left it off because he could not get enough to eat. Felt no difference in sensation.
7	William Saunders	51	A	5	June 23, 1889	—	Externally only. Pure.	Oct. 23, 1889	Pale patch on face not anesthetic. Similar large patches covering a great part of trunk. Anesthetic patches on arms and thighs. Fingers anesthetic except right forefinger. Last phalanges shortened, ankylosed; nails deformed. Skin hard and thick. Sensation diminished in forearms and legs, normal in feet. Toe nails broken.	Patches on trunk with dusky red raised margins; not anesthetic. Complete anasthesia in fingers and toes.	Since he has been in the Asylum many patches have recovered some sensation. Sometimes the raised margins to the patches disappear. (He has taken arsenic for year). Since using the oil he has noticed no particular change, but he thinks the skin is of a better colour

Results of Chaulmoogra Treatment.

No.	Name.	Age.		Form of Leprosy.	Years Afflicted.	Date of beginning oil.	Dose.	Whether used externally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statement.
		M	F									
8	William Bailey	...	44	M	13	Nov. 15, 1881	m. xv. b. d.	Yes. For one year mixed with lime water. For seven years, pure.	Oct. 30, 1889	Tuberculation of nose, forehead, cheeks, lips, arms and legs. Nostrils stopped up. Anesthesia of extremities.	Tubercles have disappeared from face and extremities. Lips not swollen. Pale wrinkled patches on legs in site of tubercles. Sensation in legs, arms and fingers better than it was, though still impaired. More or less ankylosis and destruction of phalanges in fingers and toes.	During last three or four years sensation has improved in extremities, so that he can pick up a piece of stick or feel if an ant walks over his legs. Since using the oil tubercles have disappeared from the face, arms and legs. His nostrils, which were stopped up, are free now. He left off drinking the oil nine months ago, but still rubs with it now and again.
9	Robert Hawkins	...	24	M	7	Aug. 25, 1889	m. xv. b. d.	Yes. Pure.	Oct. 25, 1889	Thickening and tuberculation of face and ears. Elbows scaly. Fingers thickened: pulps hyperaesthetic. Nails distorted. Skin of thighs and legs thickened, scaly, anesthetic. Toes ulcerated: nails destroyed.	Small tubercles on face and ears. General thickening on cheeks and chin. Sensation good. Thickening of forearm, hands and fingers. Nails broken. Sensation in pulps of fingers; not over masses of tubercle on backs of forearms. Feet and legs thickened, scaly. Nails broken. Sensation good, except above ankles. Skin of trunk mottled. Sensation normal.	Since using oil swelling of fingers of left hand has much diminished, also swelling of face and ears is less.
10	James Fraser	...	38	A	6	Aug. 23, 1889	—	Externally only. Pure.	Oct. 23, 1889	Numerous large pale patches on trunk; not anesthetic. Similar patches on arms and thighs. Fingers incurved, stiff. Ends of right fourth and left fifth are gone. Nails more or less distorted. Some phalanges shortened. Toe nails distorted. Sensation diminished in forearm, hands, legs and feet. Anesthesia in palms and soles.	A little sensation in right hand; none in left hand, nor in feet or legs. Anesthesia in left forearm; not in right. Pale patch on back of trunk. Anesthesia on face.	Since using oil he has got rid of pain in the right shoulder and arm. Some sensation has returned to right hand and to right side of back.

TABLE XVIII.—CONTINUED.

Results of Chaulmoogra Treatment.

No.	Name	Age.		Form of Leprosy.	Years Afflicted.	Date of beginning oil.	Dose.	Whether used externally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statement.
		M.	F.									
11	Egbert Swain	...	24	M	9	July 18, 1889	m. xv. t. d.	Yes. Has been rubbing with the pure oil for ten months.	Oct. 18, 1889	Few small tubercles on face, and one or two on right ear. Scars on face where tubercles formerly were. Trunk free except a few copper coloured stains behind. Fingers thin and bent back. Ulcerating masses of tubercles over knuckles. Masses of tubercle and ulcers on feet and legs. Breasts enlarged. Anesthesia of extremities.	Condition of tubercles and anesthesia the same as before using oil.	Says he has noticed no difference in the size of the tubercle masses since taking the oil, but it clears the skin and prevents dry scurf from forming.
12	Edwin O'Brien	...	21	M	8	May 23, 1889	m. xv. t. d.	Yes. Pure	Oct. 23, 1889	Tuberculation of face and extremities. Pale patches on trunk. Anesthesia of extremities.	Some thickening of lobes of ears, also below eyes and on nose. Anesthesia in little fingers: less in others. More sensation in right hand than in left. Skin of trunk supple: perspires well. Pale patches on trunk. Sensation in right foot: not in left. Toes swollen.	Since using the oil he feels better, and many of the lumps have disappeared: only those in ears remain. Sensation has returned and he can use his hands more than formerly. Skin acts better. Says there has been more change since he used the pure oil.

Results of Chaulmoogra Treatment.

No.	Name.	Age.		Form of Leprosy.	Years Afflicted.	Date of beginning oil.	Dose.	Whether used externally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statements.
		M.	F.									
13	Thornhill Spencer ...	21		M	8	June 24, 1889	m. xx. t. d.	Yes. Pure	Oct. 30, 1889	Discrete tubercles of various sizes on forehead, cheeks, nose and a few on lips. Left nostril stopped high up. Conjunctiva injected; slight chemosis of left. Photophobia. Skin of upper extremities mottled purple with dusky nodules. Tubercles especially marked over backs of fingers and towards tips, where some of them are shining and translucent with small capillaries running over them. Anæsthesia only on backs of fingers. Large collections of tubercles over thighs and buttocks. Tubercles smooth, dark, copper coloured, slightly raised. Tubercles and dorsa of feet anæsthetic. Small vesicles on soles.	Few small tubercles on face. Ears normal. Sight perfect in right eye: corneal opacity and injection of conjunctiva in left eye. Sensation normal in face. Anæsthesia of left foot and fifth fingers and right fifth. No tubercles on upper extremities. Good movement in fingers. Slight thickening remains. Nails beginning to break a little. Dark copper coloured patches on lower extremities in sites of former tubercles. No tubercles left. Anæsthesia of right dorsum. Toes not thickened: nails intact. Trunk normal. Patient is stout and well nourished.	Since using the oil swelling has gone from fingers, and some of the dark spots (remains of tubercles) have faded. Left nostril has become clear. Sensation in extremities is a trifle better. Before using the oil he could not use his hands. Tubercles were going away before he began the oil, but not so rapidly.
14	Julius Gustave ...	22		M	5	Apr. 11, 1889 (tubercles) May 31, 1889 (internally)	m. x. b. d.	Yes. with lime water	Oct 25, 1889	Numerous small tubercles on face, ears and trunk. Conjunctiva injected. Noeostopped up. Nipples tuberculated, enlarged. Thickening and tuberculation of extremities. Sensation diminished over tuberculated parts. Rough and ill-defined collections of tubercles. Last joints of fingers ankylosed, twisted in various directions. Few small ulcers on lower extremities. Toes thickened.	General thickening and some tubercles on face. Ears shrunken and lobes a little swollen. General thickening and tuberculation of extremities. Fingers thickened, ankylosed. Sensation diminished in thumb and over front of middle finger. Nipples all tubercles front and back of trunk. Nipples thickened.	Since using oil stiffness of elbows and knees has lessened. Can use his limbs better. Oil is also making him perspire. Heat has gone from abdomen. Feels more in hands now, and can close fists. Has been rubbing with Chaulmoogra liniment for four months and drinking the oil for three months.

TABLE XVIII.—CONTINUED.

Results of Chaulmoogra Treatment.

No.	Name.	Age.	Form of Leprosy.	Admitted.	Date of beginning oil.	Dose.	Whether used externally also.	Date of examination.	State of Patient before using oil.	State of Patient when examined.	Patient's Statement.
		M	F.								
15	Paul Macfarlane	46	T	2	June 7, 1889 (liniment) July 13, 1889 (internally)	m. x. t.d.	Yes, with lime water	Oct. 30, 1889	Numerous tubercles on face. Fewer on neck, trunk and extremities. Much thickening of skin of face and extremities. Nails becoming brittle. Openings of sweat glands hypertrophied; choked with black material. No definite anesthesia. Some deadening of sensation due to tubercular infiltration. Femoral glands somewhat enlarged.	Thickening of cheeks and lobes of ears. Many small tubercles on ale of nose and on chin; also on trunk and extremities. Fingers thickened, but wrinkles very evident. Feet not much swollen. Femoral glands not to be felt.	Since using oil, a mass of tubercle beneath skin of right forearm has much diminished. Skin of legs is more supple and subcutaneous nodules have disappeared. He feels much better and can do a lot of work without feeling tired. Perpires more than he used to, and skin generally is more supple.
16	James Inniss	24	M	8	Aug. 9, 1889	m. x. b. d.	Yes, with lime water	Oct. 23, 1889	Tuberculation of face, ears, hands and fingers. Anesthesia of fingers and legs. Scars of former ulceration of tubercles on face and fingers.	Tuberculation of nose, ears, cheeks, forehead, chin. Fingers much swollen and tuberculated; anæsthetic. Sensation in toes but not in legs. Feet in palms and forearms.	Since using oil, lumps on forehead are smaller. Lumps on back of left hand have also diminished. Sensation has somewhat improved in palms of hands. Hands used to feel stiff, but now feel moist.
17	William Toussaint	20	M	3	June 24, 1889	m. x. t.d.	Yes, Pure	Oct. 16, 1889	Thickening of cheeks and tubercles of various sizes on face. Skin of trunk mottled with yellowish patches but not anæsthetic. Few scattered tubercles on extremities. Fingers and toes swollen and rounded. Small ulcers about heels. Skin over shins is tense and shining; over feet course and thickened. Some anesthesia of feet.	Numerous small tubercles on face and ears. Thickening below eyes. Forearms and fingers still thickened and tuberculated. Movement of fingers good; no anesthesia. Feet and toes swollen: some anesthesia.	Since using oil, lumps on forehead and hands are smaller.
18	Fabien Gaston	16	A	11	June 24, 1889	—	Externally only	Oct. 16, 1889	Large taches on face and trunk, but not anæsthetic. Feet deformed.	Condition unchanged.	Only used the oil for a month. Says it made his face black. [Patient is a negro.]